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Hearing on San Francisco Vessel Traffic Service

Senate Select Committee on Maritime Industry

CALIFORNIA LEGISLATURE

SENATE SELECT COMMITTEE ON MARITIME INDUSTRY

SENATOR MILTON MARKS, CHAIR

Hearing on

SAN FRANCISCO VESSEL TRAFFIC SERVICE

November 13, 1990

San Francisco Port Commission
3100 Ferry Building, The Embarcadero
San Francisco, California

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California Legislature

Senate Select Committee on Maritime Industry

SENATOR MILTON MARKS
CHAIR

A G E N D A

SAN FRANCISCO VESSEL TRAFFIC SERVICE HEARING

10:00 a.m. Tuesday, 13 November 1990
San Francisco Port Commission
3100 Ferry Building, The Embarcadero, San Francisco

Ed Willis	Acting Deputy Administrator Department of Fish and Game
Hon. Charles Warren	Executive Officer State Lands Commission
Adm. Thomas J. Patterson, Jr. World Trade Center, Room 339 San Francisco 94111	President, Board of Pilot Commissioners
Tom Wyman, Govt. Affairs Dir. Chevron Shipping Company 555 Market Street San Francisco, CA 94105	Representing the American Institute of Merchant Shipping
Captain Morris Croce, Mgr. U.S. Ports, Chevron Shipping 555 Market Street San Francisco, CA 94105	Representing the Pacific Merchant Shipping Ass'n.
Terry Hunter World Trade Center, Room 303 San Francisco, CA 94111	S.F. Bay Area Marine Exchange
Captain Art Thomas POB 26409 San Francisco, CA 94126	President, S.F. Pilots
William Stephens, Dir. Maritime Operations Port of Oakland POB 2064 Oakland, CA 94604	Representing the Ports

Captain Oliver F. Williams 300 Oceangate Long Beach, CA 90802-4341	Sr. Advisor, Maritime Affairs, ARCO Marine, Inc
Captain John Denham 1800 Harrison St. Oakland, CA 94612	Ass't. Marine Superintendent American President Line
James Macaulay Pier 1, Berths 47-49 Long Beach, CA 90802	Regional Manager, Marine Ops Crowley Maritime Corporation
Captain James Card 400 Oceangate Long Beach, CA 90822-5399	Chief of Operations, 11th Dist. United States Coast Guard
Dr. Michael Herz Building A, Fort Mason San Francisco, CA 94123-1382	San Francisco Bay Keeper

INVITED

Matson Navigation Company (contact through Aaron Read, their lobbyist, at 448-3444)
Sierra Club (Gordon Hart, 1014-9th St. #201, Sacramento 95814)
California Coastal Commission (Brian Baird, 45 Fremont St., Suite 2000, SF 94105)
S.F. B.C.D.C. (Alan Pendleton)

Also invited Corey Brown, General Counsel
Planning & Conservation League
909-12th Street
Sacramento, CA 95814
(he told us he wasn't going to make it)

CHAIRMAN MILTON MARKS: I am Senator Milton Marks, Chair of the Senate Select Committee on Maritime Industry. I'd like to welcome you here. Sitting next to me on my right is Senator Barry Keene, the Majority Leader of the Senate. Briefly, we'd like to -- to my left is Joy Skalbeck, our consultant.

California's Oil Spill Prevention, Abatement and Removal Act directs the State's oil spill administrator to work with the United States Coast Guard to upgrade San Francisco's Vessel Traffic Service system, implement a traffic management system for Los Angeles and Long Beach harbors and for the Santa Barbara Channel. Legislation also calls for the funding to come from fees paid voluntarily by the maritime industry. If this is not viable, the administrator is directed to impose a funding mechanism.

We've learned painfully that once there is an incident, oil spill flows are rapid and unpredictable, that the state of clean-up technology is woefully inadequate to deal with North and Central Coast conditions. We all know that prevention is the critical element, and that is where our attention must be focused.

A comprehensive one-year study under the auspices of the States-British Columbia Task Force indicates that Vessel Traffic Service is one of the most essential components of prevention. A fifth of forty consensus recommendations stresses the need to upgrade existing systems and to provide effective vessel traffic management systems elsewhere.

Our committee will meet December 19th at the Port of Long Beach to address Southern California concerns. This hearing will focus on the needs for San Francisco and is being held to gather the data required to implement the VTS system provisions of the legislation as expeditiously as possible. The information we need includes: How the system should be upgraded. For example, should coverage or traffic separation lanes be expanded north or south along the San Francisco coast? Is coverage inside the bay adequate in both inclement and fair weather? If not, what is needed? How should it be funded? Should the system require mandatory participation only or both mandatory participation and control? Mandatory control would mean that ships' pilots or captains would be required to follow instructions from VTS controllers. Would this create liability problems? If so, and mandatory control is desirable, how can the liability problem best be solved?

If there are harbor-related safety concerns any of you would like to express, we would very much like to hear them.

Before we hear from our first witness, I would like to introduce my colleague, Senator Barry Keene. Senator Keene represents the North Coast and is the lead author

of our Oil Spill Act. Senator Keene, would you like to make some remarks?

SENATOR BARRY KEENE: I'll reserve my remarks.

CHAIRMAN MARKS: We have a long agenda here: Ed Willis, Acting Deputy Administrator, Department of Fish and Game.

MR. ED WILLIS: Senator Keene and Senator Marks, I am Ed Willis, Acting Deputy Administrator for the Office of Oil Spill Prevention and Response. Thank you for providing me the opportunity to testify here today.

The Department of Fish and Game has the primary responsibility for implementing Senate Bill 2040, the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act. With the passage of this landmark legislation, the State has the authority and resources to effectively prevent and respond to oil spills. Since I am sure you are aware of most of the bill's provisions, I will not discuss the bill as a whole, but I will provide some detail on the Department's role in improving marine safety.

Given the difficulties responding to oil spills, the legislation places heavy emphasis on prevention. To reduce the possibility of shipping accidents, the Department was given a significant role in promoting marine safety. The Department will be involved in the following areas: Promoting the adoption by the federal government of certain safety equipment; mandating in some circumstances tug escorts for tankers who are entering or leaving the harbors of the State; evaluating the vessel inspection program of the United States Coat Guard; determining the adequacy of programs and equipment for responding to disabled tankers; implementing the recommendations of the harbor safety committes which were created by this bill; and, reviewing the procedures and guidelines for pilotage in the State.

The legislation also gives the State a significant role in the development of a Vessel Traffic Service system in California.

The bill requires the Department, through the Office of Oil Spill Prevention and Response, to negotiate an agreement with the Coast Guard by December 31, 1991 for a VTS system to protect the harbors of the State. If the office administrator cannot successfully negotiate an agreement, the administrator will, in consultation with the Coast Guard, develop a plan for the State's implementation of Vessel Traffic Service systems. The plan shall include the harbors of San Francisco, San Pablo, and Suisun Bays, Los Angeles, Long Beach and any other areas where the Coast Guard recommends establishing a VTS system.

The plan would also specify a method for funding the implementation of a VTS system. The legislation requires the maritime industry to agree on a voluntary funding system to implement the plan. If the maritime industry cannot agree on funding, then the legislation directs the administrator to assess a fee on the maritime industry. With the plan completed and funds available, the State will be in a position to ensure

that our harbors are adequately protected.

The legislation directs the Department to work very closely with the Coast Guard and we will. All systems that are financed by the State are to be operated by the Coast Guard.

The Department recognizes the importance of VTS systems and is aware of the tight deadlines for implementing this section of Senate Bill 2040. The information during this hearing will be very helpful to the Department in planning the marine safety program. We hope to begin meeting with the Coast Guard and other interested parties soon.

With me is Mr. Roger Dunstan of my implementation team to establish this new program. Mr. Dunstan is formerly of the Senate Office of Research and a primary staff person involved in the development of Senate Bill 2040. We would be happy to answer any questions you have either about the State's role in VTS systems development or the Department's implementation of Senate Bill 2040.

Thank you.

CHAIRMAN MARKS: Thank you very much. We appreciate your being here. The next witness is Mr. Charles Warren, Executive Officer, State Planning Commission.

MR. CHARLES WARREN: Good morning, Senator Marks, Senator Keene. My name is Charles Warren. I am Executive Officer of the State Lands Commission, and I thank you for the opportunity to participate in your hearing this morning.

I'm here this morning to make you aware of the Commission's ongoing effort to comply with the provisions of SB 2040, which in this regard complement responsibilities of the administrator for oil spill response under California's new Prevention Abatement and Removal Act.

I would like to start by providing some perspective on the nature and the extent of the Commission's existing responsibilities with respect to California's maritime petroleum transportation system.

Briefly, there are 70 oil-related marine terminals in California. Of these, 20 of these terminals operate in State waters on prime and submerged lands under lease from the State Lands Commission, including 10 such terminals in the San Francisco Bay area. The Commission is concerned with the statewide implications of the continuing and growing reliance on marine transportation for meeting California's petroleum needs.

The Commission's concerns predate SB 2040. Coming before the Commission is a unique opportunity to address a number of the problems addressed in the bill concerning the leases with the 20 terminals in State waters. Within the next 5 to 7 years about one-third of the terminals will come to the Commission for either new permits, lease renewals or extension of their existing leases.

We believe the issues associated with the transportation off California's coast and

in its bays and estuaries should be studied and analyzed in a programmatic environmental impact report which considers the potential impacts of the continuing operations of marine terminals in California. We have proposed such a study and analysis to the industry and have received their qualified concurrence. The documents which we are discussing would analyze the system's ability to serve the State's present and projected oil and product transportation. I would propose alternatives to the existing system in proposing that appropriate measures be adapted to minimize these statewide or regional impacts. Such a study and analysis will also provide the Commission and the Legislature and others involved with the wherewithal to consider requests from individual terminal operators for expanding or continuing existing marine terminal activity.

Although the State Lands Commission does not have direct responsibility for implementing the Vessel Traffic Service systems provisions of the Act, we are developing information in that study in other ways which we believe will help the administrator in this regard.

A major aim of the programmatic Environmental Impact Report fortunately is addressing the adequacies of existing and proposed Vessel Traffic Safety systems regionally within San Francisco Bay and statewide. It will examine feasible methods of providing the best achievable protection of coastal and marine resources, the best achievable guidance and monitoring technologies, adequate levels of trained personnel and operational methods which may be required to provide the greatest degree of accident prevention in response capabilities. While the primary purpose of the Program Environmental Impact Report is the evaluation of California's Marine Transportation and Terminal System, its information and analysis may be applicable to regulatory programs established under the Act. This document may also assist the administrator to comply with the requirements for new marine safety programs under the Act, including VTS systems.

We continue to work closely with the administrator's office to ensure close coordination of our efforts as required by the Act. Effective oil spill prevention and management can be best assured if everyone provides total support of the other's endeavors in this essential program.

To more efficiently comply with its responsibilities under SB 2040, the Commission has contracted with Mr. Gary Gregory, a consultant who is also here today. Mr. Gregory is a retired U.S. Coast Guard Commander recently retired, and during his service with the Coast Guard obtained considerable experience as a Systems Safety Officer, both with experience in San Francisco Bay, Southern California, and in Washington, D.C. I've asked Commander Gregory to be with you at your hearing in Long Beach so that he can either give you further briefings at that time personally and be available to you for

questions.

The Commission has also established a separate facility -- a Facilities Inspection and Management Division within the agency -- with primary offices in Long Beach and Vallejo at the California Maritime Academy. As part of the Commission's training program for its own staff, recently we were involved in a briefing by the faculty of the Maritime Academy which focused on some of the problems associated with the present vessel navigational system within the Bay.

I have with me a 23-page document, a presentation prepared for us by the Maritime Academy which describes the ships which enter San Francisco Bay, and barges which use the Bay's personnel of the vessels and the mooring operations and the pilots -- describes the bays and the ports, the operations such as moorings and lighterings. It discusses the navigational hazards of the Bay, and finally, it gives an overview of the Coast Guard's Vessel Traffic system, which is available in the Bay. I can make copies of that report available to your committee if you think it would be worthwhile.

CHAIRMAN MARKS: We'd like that.

MR. WARREN: I have one copy. May I give it to you now and ask you to return it when you are finished?

CHAIRMAN MARKS: Sure.

MR. WARREN: We will continue to keep the committee informed of our activities and will provide additional testimony at your December 19th hearing in Long Beach.

And I thank you very much for the opportunity to be with you this morning.

CHAIRMAN MARKS: Thank you, we appreciate your being here. Senator Keene has a question.

SENATOR KEENE: You indicated you were in cooperation with Mr. Willis. Specifically, are you in touch over the design of the Environmental Impact Report that you're preparing?

MR. WARREN: The scope of the document that I've described for you is being discussed with the industry representatives at this time. As soon as agreement has been reached with them, and I think that's fairly soon, then the document will be circulated to other agencies for their review and comment.

We have met with Mr. Willis at the -- it must have been a week, I think, the meeting of the State Interagency Oil Spill Committee (SIOSC) and we advised SIOSC at that time of the preparation of the Environmental Impact Report which I described. I previously told Mr. Willis of it in private conversation so that he is aware, and I'm confident that it will be meshed with his responsibility under SB 2040.

We also have ongoing, as you know, a federally mandated VTS study of the nation's existing systems, including one in California about which you will hear more this morning. It's important, and I think you will note that all these efforts be

coordinated, that they cannot overlap, they do not duplicate so that the result will be an improved product.

SENATOR KEENE: Is he confident that it will be?

CHAIRMAN MARKS: Mr. Willis?

MR. WARREN: I don't know.

MR. WILLIS: Yes, I want to make sure we get off to a good start.

CHAIRMAN MARKS: We're cooperating.

SENATOR KEENE: That was a short answer.

CHAIRMAN MARKS: Thank you very much. Appreciate your being here.

Admiral Thomas J. Patterson, President, State Pilot Commission.

ADMIRAL THOMAS J. PATTERSON: Good morning, Senator Keene, Senator Marks. Once again we are encouraged and reassured of the interest by you and the Senate Select Committee in deep draft ship traffic in California waters, including the bays of San Francisco, San Pablo, and Suisun and their tributaries leading to the ports of Sacramento and Stockton.

The safety record on these waters, despite increasing and deeper draft vessel traffic, is in large part due to the round-the-clock vigilance of the military and civilian personnel at the Vessel Traffic System. They have a close working relationship with the skilled and experienced pilots licensed by the Board of Pilot Commissioners. We are informed that these pilots rely heavily on the services provided by VTS to ensure safe vessel movements.

The VTS provides to the pilots current, accurate, and continuous information not otherwise available. This system expands the pilot's geographical range of knowledge essential for safe navigation. The VTS permits the pilot to disseminate information regarding his ship for the benefit of other ships and shore stations.

The Board of Pilot Commissioners highly endorses the VTS and the role it will play in the Harbor Safety Plans to be prepared by the Harbor Safety Committee. A smoothly coordinated program melding the existing proven systems and organizations with the provisions of the Oil spill Prevention, Abatement and Removal Act is essential.

As a government agency with some responsibility for the safety of commercial vessel activity on these waters, the Board of Pilot Commissioners pledges its full cooperation and assistance to this priority program.

We recommend in the best interest of communications and coordination that the president of the Board of Pilot Commissioners be assigned to the Harbor Safety Committee for San Francisco mentioned in Article 3, Section 8670.23, page 34 of the bill.

Under Section 8670.24, page 38, where it states that "the Administrator shall evaluate all pilotage areas", this Board looks forward to fully briefing the

administrator and assisting in the evaluation of the areas of licensing, investigation of pilot incidents and pilot training.

In the latter, we are pleased to report that we are now expanding the pilot training from just training pilot trainees to include refresher training for all serving pilots holding state licenses.

The first phase will train 56 bar pilots and a small number of inland pilots at the Port Ravel facility in Grenoble, France. This one-week training course will start in late Spring 1991 and take approximately 24 months to complete. A $50 surcharge is being charged for each ship movement to fund this phase of the long-range training program.

In summary, the Board believes that qualified, experienced and constantly trained pilots, working with the VTS, will continue to be a major contributor to marine safety. Our recommendation is to retain and expand the present VTS in San Francisco. One extension to evaluate would be to move the coverage north to include up to the Southern Pacific Railroad bridge just north of Benicia. This is a critical passage for both up- and down-bound ships.

Finally, while tankers and tanker barges are the focus in this new and important legislation, we must always remember that all vessels of all types require marine safety and eternal vigilance.

I thank you for this opportunity to comment for the Board of Pilot Commissioners.

CHAIRMAN MARKS: Thank you very much. Any questions? Senator Keene.

SENATOR KEENE: Any additional training that will be undergone...(inaudible)

ADMIRAL PATTERSON: It will be for all vessels in the San Francisco Bay area, and it will be tailored especially for the conditions in San Francisco, Suisun, San Pablo bays. There will be a special course designed for San Francisco bar pilots at this facility, but the pilots will get a heavy exposure to handling deep draft tankers (inaudible).

CHAIRMAN MARKS: Thank you very much. Appreciate your being here.

Tom Wyman, Governmental and Public Affairs Director, Chevron Shipping Company.

MR. TOM WYMAN: Senator Marks, thank you very much. Senator Keene. I'm Tom Wyman, Chevron Shipping Company, and I'm here today representing the American Institute of Merchant Shipping. We call it AIMS.

AIMS has 21 members. We operate a wide variety of U.S. flag vessels and frequently speak out on international issues and national issues, as well as state issues where they involve the national scene.

We'd like to emphasize at the outset that the oil spill legislation that was recently enacted by the U.S. Congress -- the Oil Pollution Act of 1990 -- directly conflicts in the sense of timing with the legislation that was recently enacted by the

State of California.

Let's start off by discussing the Oil Pollution Act of 1990. It calls for the Secretary of Transportation to conduct a study to determine and prioritize what ports and harbors require a VTS, what ports and harbors should have expanded VTS, or improved VTS systems. The study to be prepared by the Secretary of Transportation must be completed within one year of enactment, which means it must be completed by about September, 1991. And, of course, it will take some months thereafter for the Congress to pass on the recommendations contained in the report of the Secretary of Transportation.

Now, during that same time, the State legislation calls for an administrator who's yet to be appointed, I understand, to negotiate an agreement with the Coast Guard by the end of next year, December 31, 1991, to determine the operation of a VTS to protect the harbors of the State. If an agreement cannot be negotiated by that date, the administrator is required to develop a plan with the Coast Guard, implementing VTS for California harbors and the Santa Barbara Channel as required. You have to appreciate that the State is moving ahead on one schedule and the federal government on another. There's going to be an inevitable problem in terms of conflict, in terms of who's doing what and whose recommendations will take precedence.

The state legislation also calls for creation of harbor safety committees by the middle of next year, and among the various charges of the committees will be for them to determine what should be done about the VTS arrangements in the State of California. Here's another case of something that is required under state legislation that involves VTS at the same time does not go in federal responsibilities.

Clearly, as now set forth, the State and federal time schedules overlap, which could present serious contradictions and possible conflicts.

California legislation states that it is the intent of the Legislature that VTS systems and vessel traffic monitoring and communication systems be completed and operated by the Coast Guard. AIMS certainly agrees with this intent as expressed by the Legislature, and at this point we would like to recommend that the State, through its administrator, who is yet to be appointed, and the harbor committees that are to be appointed to start off by cooperating with the Coast Guard in the development of its federal study. At the time the federal study results are available, it would be possible to determine what actions the State might need to take independently which may not be included in the federal study.

The procedural matters should be cooperatively resolved before addressing the main issues themselves as to what should be done concerning VTS arrangements in California. Otherwise, we've got a situation of a couple of freight trains heading down converging tracks and inevitably there's going to be a collision. We do emphasize the need to

work this out cooperatively.

AIMS certainly concurs with the intent expressed by the State Legislature and agrees that national oversight of VTS is necessary for proper operation of the system.

We are going to participate actively in the VTS review at the national level as well as those here in the State of California. We maintain a committee structure within AIMS, and we have already appointed a small group to examine VTS needs and to participate in the review process that will be initiated at the federal level and be undertaken by the U.S. Coast Guard Office of Navigational Safety and Waterway Safety in Washington, D.C.

In summary, we do see a potentially serious conflict in the VTS review and assessment schedules as between he State of California and the federal government. It's clear the objectives of both groups are parallel in seeking the (inaudible) of Vessel Traffic Systems, which best suit California requirements.

Therefore, we urge that California participate actively in the federal studies mandated under the Oil Pollution Act of 1990.

(portion in tape inaudible)

MR. WYMAN: Well, Senator, I appreciate what you're saying. I...(inaudible)...with respect to the federal government. Nevertheless, the Coast Guard does have a very specific time schedule with which they must conform.

While we may have to wait for Congress to act on the recommendations of the study, the time schedule of the State of California should be acceptable since the U.S. Coast Guard review and recommendations must be completed by September 1991. We urge that California adopt a cooperative attitude rather than the State and the Coast Guard each proceeding independently.

SENATOR KEENE: We want -- we will work with them...(inaudible)

MS. JOY SKALBECK: (Inaudible)

MR. WYMAN: (Inaudible).

CHAIRMAN MARKS: Captain Morris Croce.

CAPTAIN MORRIS CROCE: Good morning, Senator Keene, Senator Marks. I am Morris Croce, Manager, U.S. Ports, Chevron Shipping Company representing here today the Pacific Merchant Shipping Association.

The Pacific Merchant Shipping Association is the only regional maritime association on the West Coast, representing 43 ocean carriers, both cargo and tanker operations, with vessels calling on the West Coast.

In the San Francisco Bay Area, the U.S. Coast Guard-run VTS has been aiding vessel navigation since 1973. PMSA has long supported this activity. In 1983 when the U.S. Coast Guard announced, as part of its cutbacks, it was closing the VTS in San Francisco, PMSA responded immediately and helped form the coalition to save the VTS.

This coalition spearheaded a full court press to prevent the VTS closure.

It did more, however, than simply create public pressure. In a period of a few months, it raised, on a voluntary basis, over $190,000 to financially support VTS. By putting "our money where our mouth was", we demonstrated beyond any doubt the value we place on the U.S. Coast Guard VTS here in San Francisco.

During the most recent legislative session, PMSA once again played an active role in supporting VTS. The portion of the Lempert-Keene-Seastrand Oil Spill Response Act which addresses VTS includes several points specifically recommended by PMSA. Those include:

1. The State Administrator must work with the U.S. Coast Guard in developing any VTS in the area.
2. If the Administrator cannot negotiate an agreement with the Secretary, he must, in consultation with the Coast Guard, develop a plan for implementing a VTS by December 1992 which is to be run by the U.S.

   Coast Guard but funded either voluntarily or through a revenue funded system with the State and submit legislation to develop a State-funded VTS program.
3. The Administrator must consider the recommendations contained in Harbor Safety plans as prepared by the Harbor Safety Committees.

It was the intent of the Legislature that any VTS be operated by the U.S. Coast Guard and the State should develop and operate systems only if the federal government has not expeditiously fulfilled its responsibilities.

The crucial element we insisted upon was the U.S. Coast Guard operate any VTS development system, existing or new. We also wanted to emphasize the important role of the newly created Harbor Safety Committees. These committees, which will consist largely of maritime experts familiar with their respective harbors, should be the focal point for commenting on the adequacy of existing VTS or the need for new systems.

Specifically, with regard to the San Francisco Bay region, we are supportive of the Coast Guard's desire to expand the present system to provide coverage of San Pablo Bay and Carquinez Straits. We recognize this is a busy waterway, parts of which are narrow, transited by deep draft vessels, many of which carry hazardous materials. We believe that the U.S. Coast Guard, as part of its nationwide VTS study as mandated in the Federal Oil Pollution Act of 1990, will formally recommend this expansion. The federal study is required to be completed by August 1991, just 9 months from now. It is extremely important that any action await the outcome, as national uniformity for VTS is critical.

With respect to the funding issue, we support the Coast Guard's continued funding

of the VTS, including the cost of any expansions. We recognize, however, that given the federal deficit situation, such funds may be difficult to obtain. The Act recognizes that and suggests a voluntary fee system.

While this perhaps sounds like a good idea, we doubt that a voluntary system will work. There will be always some carriers who will not pay their fair share. This will eventually create a shortfall in receipts that will require the "good guys" to cover the shortage. It wouldn't be too long before no one is participating in the voluntary funding and thus it will collapse.

We are left with the final alternative in the Act, or a state-mandated user fee. With the understanding that funds generated by this fee are used for the VTS only, PMSA would agree with such an approach. We appreciate the opportunity to comment on this important subject.

CHAIRMAN MARKS: Thank you very much; appreciate your being here.

Terry Hunter.

(portion of tape inaudible)

MR. TERRY HUNTER: I'm only going to take a second or two to let everyone know what...(inaudible)

We're available -- we're open 24 hours a day, 365 days a year, and we fill in the areas between the private sector and the public sector...(inaudible)...and private industry and also governmental agencies wanting information about shipping. We have...(inaudible)

We have records now going back to -- well, available -- back to 1911 to shipping...(inaudible)

We track an enormous amount of knowledge and I think...(inaudible)...San Francisco Bay running smoothly because there are hundreds of areas of information that needs to be filled in as ships are moving through the Bay. (Inaudible) needs to know when the ship...(inaudible)

CHAIRMAN MARKS: Thank you very much.

Art Thomas...(inaudible)

CAPTAIN ARTHUR THOMAS: Senator Marks, Senator Keene, Joy, ladies and gentlemen, I'm Captain Arthur Thomas, newly elected Port Captain and President of the San Francisco Bar Pilots.

Before I read a prepared statement, Senator Marks, in the invitation to attend, three questions were specifically addressed by Joy to me. I would like to verbally respond to those for the record.

We were asked whether we thought the coverage in San Francisco needed to extend north or south along the coast. It's the opinion of the San Francisco Bar Pilots, and I'm sure a lot of our industry customers and USCG friends here and probably up and down

the coast, that we should be looking at the offshore vessel movement reporting system which is presently in place and utilized by the Coast Guard and by traffic as it approaches and departs the San Francisco Bay region. There's one area where extension might take place.

And we agree fully with Admiral Patterson and the State Board of Pilot Commissioners that somewhere funding must be found to allow VTS to provide radar surveillance from the area north of Point San Pablo towards San Pablo Bay to the Martinez Highway Bridge or the SP Railway bridge to the north. That area is primarily trafficked very heavily with deep draft tanker vessels. There are continually potential hazards in that area.

The second question was whether coverage inside the Bay is adequate in both inclement and clear weather, and if not, what would be needed to make it adequate. Frankly speaking, from the point of view of the prime user of VTS in this area -- the pilots -- we find that VTS in this area is outstanding. I could not, in the short period of time that I had to prepare for this, think of any areas that were at fault or lack of adequacy with current coverage of VTS.

Then we were asked whether the system should be mandatory, and if so, should commercial vessel reporting be both by participation or should controllers' instructions be mandatory. Our position has always been, since we were heavy participants in the original formation of the VTS and since we were participants in the course in the Waterway Safety Act legislation effort which was enacted in 1972, we have strongly supported the idea that the participation in VTS should be mandatory but that it is very difficult for ships' masters and pilots to fully comply with orders given on the radar scope unless they're talking to another experienced ship master pilot.

Senator Marks, Senator Keene, as you know, the San Francisco Bar Pilots have been providing assistance to vessels transiting the Golden Gate since the mid-1830's. Despite a major revolution in technical improvements in ship design, propulsion systems, and navigation aids, there remain substantial problems in safely moving vessels through the Golden Gate and through the Waters of the San Francisco Bay region.

The modern commercial vessel is faster, heavier, deeper, and less maneuverable than its predecessors. Such ships are difficult to maneuver at slow speeds, especially in the confined and shallow waters of the San Francisco Bay region. The traditional nemesis of navigators -- strong winds and currents -- still play a capricious role in safe vessel movement. Although modern radar has had a tremendous influence on the safe movement of vessels, fog continues to be a serious factor in such movements. The tragic collision of tanker GOLDEN GATE and the fishboat JACK JUNIOR off Point Reyes in 1986 is just an example of when shipboard radar can prove to be a very false friend.

Large commercial vessels which are restricted by relatively narrow channels must

compete for water room with fleets of recreational vessels, fishboats, as well as other commercial vessels.

Moreover, shipboard systems, while generally excellent, are not always reliable. For example, in 1988, the tanker ARCO JUNEAU collided with the Carquinez Bridge. An ensuing investigation revealed that the onboard radars were not properly calibrated and the ship was some 200 feet from where the radar plots showed it to be.

What experience has taught us is that for proper and safe movement of vessels, we need, in addition to competent crews, navigators, and seaworthy vessels, pilots and VTS working together within a positive control system. VTS supplies that important role. VTS provides positive information so that vessels are kept safely separated from each other and maintains the course and track of vessels as they proceed through the waters.

Nowhere was the importance of VTS best revealed than in the 1971 collision of two Chevron tankers at the Golden Gate. That collision occurred despite the fact that both ships had competent masters who worked for the same company and both had working bridge-to-bridge communication systems and onboard radar. However, at that time neither vessel was operating under a positive control system and both proceeded with the expectation that the other would give way. Their joint mistake proved to be an environmental disaster and proved to be the foundation stone of what we now know as our local VTS.

VTS is not an infallible system, but its record over the past two decades is impressive. Since its full scale adoption, there have been no serious collisions in these waters between VTS-controlled vessels.

How effective it is perhaps is best made clear by a situation which arose about a year-and-a-half ago. A vessel being advised by a San Francisco Bar Pilot operating with VTS was surprised by a vessel which refused to take local pilots and whose master was not in communication with VTS. That situation was saved by a warning call from VTS to the pilot which identified -- which reported the unidentified vessel bearing down on him. Because VTS recognized the threat that the unidentified vessel presented to the pilot and gave an adequate warning, the pilot was able to take effective measures to avoid a collision. This incident tells me that VTS plays a very important role in accident prevention, and, in this case, I think it can be safely said that a serious casualty was avoided by VTS.

VTS is an expensive system, but it must also be said that its cost can be offset many times over by the environment and property losses which would have occurred but for its intervention. For that reason, any plan involving marine safety must include a fully functioning VTS system. This fact is most clear to those who use it on a daily basis, and that's the men and ladies of the San Francisco Bar Pilots.

Having said that, I must also express the concern that all members of the Bar

Pilots have felt when VTS has been subject to budgetary attack. VTS is clearly a local system. While its benefits extend nationwide, the most telling benefits are on a local level. For the past two decades, the Coast Guard has been faced with fluctuating budgets. Many of these budgets have threatened to trash VTS in the interests of federal budget considerations. Such attempts have so far been beaten back by an unusual coalition, as was mentioned earlier, of industry, labor, pilots, and environmentalists.

However, recognizing how significant VTS is to safe navigation, we at the state level cannot sit back and idly expect Uncle Sam to continue to bail us out. We must be prepared with a plan to address this issue and be prepared to take over the system if the Coast Guard is faced by budgetary constraints to back away from it.

We all know the Coast Guard has been given a potpourri of missions. Its budget has been cut and pasted to fill the immediate needs and concerns. In this environment the emphasis on marine safety has swung back and forth like a pendulum. Such adjustments may be appropriate on the national level, but we cannot afford to have local maritime safety imperiled by such considerations.

We believe the role of VTS should not only be preserved but expanded. We feel all commercial vessels should be required to utilize the system. In other words, participation in the system should be mandatory and not merely voluntary.

Secondly, we believe that technical improvements should be considered and developed, including perhaps the use of transponders on vessels so that the course and the speeds are read and outlined in radar displays, even in VTS. That's very similar to air traffic controllers and its feasibility as studied...(inaudible)

Perhaps the most important of all, we feel that serious consideration should be given to the State of California or a private organization taking over VTS if budgetary problems do...(inaudible.) In fact, we so strongly are concerned about this that the San Francisco Bar Pilots would be willing to give serious consideration to taking over and operating the system ourselves. We are, after all, the primary users of the system and the people who are most directly affected from the standpoint of our careers by a properly functioning VTS system. We would propose that, in that instance, we replicate to a large degree what has been done by the pilots in Rotterdam and other locations...(inaudible)...and operate that system locally. Having the pilots take the system, we think, would be relatively easy since pilots are well trained and knowledgeable about both local waters and vessel communication needs and are also competent and qualified radar operators.

The system could be paid for in much the same way that pilotage tariffs are billed and paid. In essence, this would be a user supported system which industry would pay for based upon the number and size of its vessels and how often they operate in these

waters, and there are other private organizations, the ones that testified this morning...(inaudible)...who might participate in operation of such a system if it became necessary.

The rest of this statement, I think, can be submitted for the record, and I certainly don't want to carry on, but I would like to respond to any questions that you have, Senator Marks, or you, Senator Keene.

CHAIRMAN MARKS: Thank you.

SENATOR KEENE: The incident involving the coalition...(inaudible)

CAPTAIN THOMAS: Senator, that is one of the areas that I mentioned when I first started to speak. That is the area between the Martinez Highway Bridge/SP Railway Station and Point San Pablo...(inaudible)...which is uncovered by radar surveillance and there is no possible way for VTS to give us a hand in that area. We use a vessel improvement reporting system and pilots report periodically.

SENATOR KEENE: The rest of it is being covered?

CAPTAIN THOMAS: It might not have been successful although it's a very narrow confined area and the pilot and the ship master, I'm sure, will rely extremely heavily on...(inaudible).

CHAIRMAN MARKS: Thank you very much. Appreciate your being here.

William Stevens, from the Port of Oakland.

MR. WILLIAM STEVENS: Senator Keene, Senator Marks, thank you for the opportunity to address your committee today. My name is William Stevens and I am the Director of Maritime Activities for the Port of Oakland. I'm also here representing the California Association of Port Authorities.

My comments today are going to focus on two primary issues: one, the role of the Coast Guard, and two, funding. You previously heard from other speakers about those things, but I would like to emphasize that the San Francisco VTS system, which was the first pilot system in the United States, has been a very successful renowned system of success and it's led to development of similar systems in other ports of the United States. Historically, navigation has fallen in federal jurisdiction; Coast Guard's role is well known to all of us. It's important the upgrading of the system goes with the expansion of the radar coverage of the Carquinez Straits area as well as other technological improvements that could come along, including television monitoring in sensitive areas.

Regarding the issue of funding, I wish to point out that the current system is federally funded, and the bill, as written, appears to not take this into account. I would suggest we make every effort to protect that stream of funding so as to not create an additional expense to the maritime community in California. Funding on a voluntary basis seems impractical as it would not spread the load evenly. If a state

revenue system is required, it should be structured to be more equitable.

I appreciate the opportunity to speak before you today and would be happy to answer any questions you might have.

CHAIRMAN MARKS: Thank you very much.

Captain Oliver S. Williams.

CAPTAIN OLIVER S. WILLIAMS: Good morning, Mr. Chairman, Senator Keene. My name is Captain Oliver Williams. I'm a graduate of the California Maritime Academy, and have spent all of my professional career in marine transportation. I am currently Senior Adviser in Maritime Affairs for Arco Marine, a wholly owned subsidiary of Atlantic Richfield Company.

Arco Marine owns and operates ten U.S. flagged tankers ranging in size from 70,000 to 265,000 dead-weight tons. These vessels are employed in the transportation of north slope crude from Valdez to the West Coast, and make about 145 port calls per year to California ports. We at Arco are very proud of our safety and environmental record in operating these vessels.

I estimate that 90 percent of all marine accidents are caused by human failure, and most of these accidents occur in harbors or in the approach to the port. A Vessel Traffic Service (VTS) that is professionally operated with state-of-the-art equipment, and with mandatory vessel participation and, when necessary, mandatory vessel control, would combine to make vessel traffic safer in our ports.

There is some resistance in the maritime industry to supporting VTS systems that would include mandatory vessel participation and mandatory vessel control. This dates back to the maritime tradition that the master of the vessel answers to no one. This must and will change. The bridge team concept where everyone contributes to the operation of the vessel must be used, and mandatory vessel navigation commands by a Vessel Traffic Controller would be part of this change.

I testified in July this year before the U.S. House of Representatives Subcommittee on Transportation, Aviation and Materials. In that testimony I pointed out that many ports in the world have Vessel Traffic Services that far exceed anything found in the United States. An excellent example of this is the Port of Rotterdam.

The Rotterdam VTS system has a network of 26 radars, and each radar has its own tracking system. The tracker calculates every three seconds and the data is sent by telephone line to real-time computers in the traffic center. The computers combine the information from the different trackers into one picture on the control center's radar screens. Also, raw radar video is transmitted by microwave and coaxial cables and is also shown in the radar screens.

Three coastal radar direction finders automatically pick up vessels reporting in by VHF radio, and the bearing information is sent by telephone lines to the traffic

center. This makes it possible to identify vessels on the radar screen. They also use some television coverage, and the whole VTS system has an excellent VHF radio communication system.

The normal practice of the Rotterdam VTS is to provide information to the captain or pilot on the traffic situation, intentions of other vessels, the ship's position if necessary, and other relevant information. The captain remains responsible for navigating his vessel, making use of the information provided. Under special circumstances the VTS control center will give binding orders to the vessel.

The San Francisco Bay Area now has a Vessel Traffic Service that is operated by the Coast Guard. This VTS offers a traffic routing system, a communications network and a surveillance system. Participation in the San Francisco VTS is on a voluntary basis. The San Francisco VTS should be properly equipped and manned, and require mandatory vessel participation and, when necessary, exercise mandatory vessel control.

There have been numerous incidents in San Francisco that have resulted in groundings, near misses between vessels, collisions and allisions(?), that could have been prevented by a VTS with mandatory vessel control. There must be a concerted effort by all concerned at improving the navigation of vessels in San Francisco, and a mandatory VTS would be a step in that direction.

San Francisco VTS should have sophisticated equipment similar to that in Rotterdam that would allow for communicating, tracking and controlling of vessels. The operators must be properly trained and maintain a good working relationship with their counterparts aboard the vessels.

The ports of Long Beach and Los Angeles have never had a VTS operated by the Coast Guard, nor do I believe they now require one. Both the Long Beach and the Los Angeles pilot stations are radar equipped, and have historically assisted vessels entering or departing their harbors. This utilizes marine professionals assisting one another, pilots ashore assisting the vessel master and pilot.

The Long Beach-Los Angeles Marine Exchange Port and Navigation Safety Advisory Group has been working for the last two years on creating a Vessel Traffic Management System (VTMS) for the port. This Safety Advisory Group is comprised of representatives from the tug and barge, dry cargo vessels, and tanker industry; U.S. Navy and Coast Guard; and Port Authorities and pilots from both Long Beach and Los Angeles.

This proposed Long Beach-Los Angeles Vessel Traffic Management System will include both port areas and a geographic area extending about 20 nautical miles seaward. There will be a VTMS Control Center at the Marine Exchange in addition to the two pilot stations. The primary responsibility for the VTMS will be information exchange with the vessels within their jurisdiction.

The VTMS will, however, require vessels' position reporting, special restriction

not exceeding 12 knots in the Precautionary Area which is located outside the breakwater; a vessel separation in this Precautionary Area of 460 meters (1/4 nautical mile); and when entering the Precautionary Area the vessel must be on-hand steering, with the Master on the bridge.

The difference in geographical complexity between San Francisco and Long Beach-Los Angeles harbors would dictate that different levels of vessel traffic management are required in these ports.

I believe that the Coast Guard VTS Ports Needs Study will also recommend different concepts for these ports. It is my understanding that this study will not be fully completed until early 1991, and not be made public until late 1991.

I believe that Vessel Traffic Services that are tailored for the location, are properly equipped and manned, can be a real contributing factor in reducing marine vessel casualties.

This concludes my formal remarks, Mr. Chairman. I would like to thank you on behalf of Arco for the opportunity of appearing before your committee today. I would be happy to answer any questions.

CHAIRMAN MARKS: Do you feel that VTS...(inaudible)

CAPTAIN WILLIAMS: With upgraded and sophisticated equipment -- an example, in Rotterdam they have the ability there to just use special light pencils on the radar and determine how far they are apart, what the speed of the ship is and what its course is. When they report in to identify their ship -- and each ship is identified by RDF bearings -- they know exactly what ship it is. Our present systems in the United States are far behind that ability. It is true that the federal funds to the Coast Guard must be adequate...

SENATOR KEENE: Does Rotterdam have the...(inaudible)

CAPTAIN WILLIAMS: Now, the Rotterdam system, contrary to what a speaker earlier said, it is not run by the pilots; it is run by the Port of Rotterdam and also the Ministry of Transportation, which is the Netherlands Federal Government, and it is a vessel traffic service: it requires mandatory participation and when necessary gives mandatory orders.

SENATOR KEENE: How do you enforce...(inaudible)

CAPTAIN WILLIAMS: Vessel Control Center does. You must have people who are properly trained. Like in Rotterdam, almost all of its people in the vessel traffic service ashore have marine backgrounds and they have experience on ships -- have a close working relationship with shipboard people. They have a few control centers and the one that's the most seaward uses pilots in that control center during periods of low visibility. A VTS should have the ability to control vessel traffic service rules, vessel separation, one-way traffic, and, if necessary, to control vessels.

SENATOR KEENE: What is the difference between VTS and VTMS?

CAPTAIN WILLIAMS: VTMS is more of an information exchange on vessel traffic, like they are trying to set up in Los Angeles-Long Beach. As a rule, less complex port situation down there plus we do have the two pilot stations that have radar that are manned by pilots communicating with the vessels. All vessels use it even if they're not using the pilots. Even Navy ships check with the pilot stations. Even vessels with a Master who is doing his own piloting still checks in with the pilot station to receive updated traffic information.

SENATOR KEENE: What is the difference between the two, the VTS and the...(inaudible).

CAPTAIN WILLIAMS: Well, one is more for providing information so that the vessels themselves can make the decision on what they should be doing.

SENATOR KEENE: (Inaudible)

CAPTAIN WILLIAMS: I see the San Francisco VTS as being mandatory participation and mandatory controls when necessary. They must manage space, giving commands to the ships when it is necessary to have one of the two ships slow down, change course, or whatever. They should have this control, but you must have sophisticated equipment, you must have proper training personnel.

SENATOR KEENE: Okay, if you do have to have control, how would...(inaudible)

CAPTAIN WILLIAMS: Same thing as any law. When things are laws and regulations, then they are forced by appropriate authority.

SENATOR KEENE: Right, which authority? ...(inaudible)

CAPTAIN WILLIAMS: It does have mandatory control; it exercises it when necessary. That's the Rotterdam Port Authority and under the Netherlands Ministry of Transportation...(inaudible)

SENATOR KEENE: We do not now have that...

CAPTAIN WILLIAMS: We don't even have mandatory vessel participation; it's voluntary participation.

SENATOR KEENE: What's your...(inaudible)

CAPTAIN WILLIAMS: Most of them do.

CHAIRMAN MARKS: (inaudible)...Thank you very much.

Captain John Denham.

CAPTAIN JOHN DENHAM: Good morning, Senator Marks.

Historically, American President Lines has supported the Vessel Traffic Service concept as a major factor in the promotion for increased vessel safety. When the government threatened to close the San Francisco VTS, the Marine Superintendent of APL, as Chairman of the Marine Exchange's Harbor Safety Committee, led a delegation to Washington to save the VTS. As I recall, Senator, you were part of that team. We were

very successful that time and did change the Secretary of Transportation's plans.

During the past year American President Lines has undertaken an extensive review of all its marine operations. Based on the results of the seminars, the workshops, the interviews with all our senior ships' officers, and an extensive evaluation of our day-to-day at-sea operations of our 23 U.S. flag container ships and our 7 general cargo ships of the Ready Reserve Fleet, which we presently operate for the U.S. Government, we have reaffirmed that VTS is a significant factor in increasing the safety of harbor and coastal waters' navigational safety.

We consider that VTS as a service is an extension and tool of pilotage. We employ pilots to increase vessel safety, protect the public interest, and increase the efficiency of our marine operations. The law of the sea requires that a vessel maintain proper lookout by all available means. We consider the VTS as one of those means.

We demand our officers, and pilots when employed, participate in traffic systems wherever available. It is just good seamanship. We feel that the service provided in the San Francisco Bay region is excellent and we desire that it continue.

It is our opinion that the management of vessel movements is a matter requiring expert knowledge and experience by those involved in directing those operations. Pilot, marine operations management, and wharfinger inputs must be closely coordinated if a vessel traffic system is initiated. However, if a traffic service, such as we now have in the San Francisco area, is continued, then we consider that it's only necessary to increase the indoctrination and training.

Although American President Lines no longer regularly ply the route to Stockton or Sacramento, our responsibility in the managing and operating ships for the government can require us to transit the bays of San Pablo and Suisun again. Therefore, we concur in the need to extend the radar coverage of VTS to those bays.

If we have an opportunity to increase the capability of the present service, we feel it should be in the area of monitoring vessel movement and projecting their intended movements. We feel that this is within the state of the art to project the intended movements of vessels within the present area of coverage. Or, for example, by electronic means, display a fast forward scenario of the intended track and intentions of vessels and view what possible risks they might incur. This feature in VTS could alleviate many potential problems and markedly increase the margin of safety for vessel operation in congested waterways.

Finally, APL encourages the Coast Guard to continue to fulfill their responsibility in the Ports and Waterways Act, which is to provide and operate VTS, and in the 1990 Oil Pollution Act. We believe that the service is excellent and therefore does not need to be fixed.

We support an increase in the area coverage, training, and indoctrination, especially for the small boating public, and improved capability in the form of the proposed projected intended movement analysis.

APL is among one of the few remaining U.S. flag container ships in the Bay Area. VTS helps us compete. In almost every recent legislative act to improve the safety of waterborne commerce, our industry, which includes the bulk oil carriers from whom we purchase our fuel oil, has been required to pay more; we can only pass those costs on to our customers.

APL has undergone considerable cutbacks in order to remain competitive. As a result, we are extremely sensitive to any increases in operating expenses without commensurate revenue gains. In improving and refining the present VTS system, in order to raise the level of safe navigation in our bays and coastal waters, the factor of cost effectiveness must be seriously considered.

Pleased to answer any questions you want to ask me.

CHAIRMAN MARKS: I'm trying to get the...(inaudible)

CAPTAIN DENHAM: No, we have no problem with that.

CHAIRMAN MARKS: Thank you very much. Appreciate your being here.

Jim Macaulay...(inaudible)

MR. JIM MACAULAY: Good morning, Senator. I'm going to represent Ron Duckhorn, Vice President, Harbor and Passenger Services, Crowley Maritime Corporation. I'm the Regional Manager of Operations for California. We operate tugs and barges in San Francisco Bay as well as Log Angeles. We are the transportation of crude oils up and down the coast and we are in favor of vessel traffic systems.

We are currently in participation in the vessel system here in San Francisco as well as in the Puget Sound area and the Valdez area. Those two areas we also provide the tanker escort to enhance the safety of the transportation of the oil.

Our main concern is that we feel that vessel traffic systems should be mandatory systems and that they should be mandatory for all participants, not just the commercial sector. We find that especially in the northern areas, the fishing fleets and the recreational people are not always versed in the "rules of the road" and safe navigation and pose a great hazard to shipping. That's probably our main thrust at this point, is that it be a mandatory system and it be imposed on all of us.

CHAIRMAN MARKS: Thank you very much. Appreciate your being here. Captain James Card.

CAPTAIN JAMES CARD: Good morning, Senator Marks and Senator Keene. I am pleased to be here today.

I am Captain Jim Card. I'm Chief of Operations, Eleventh District, and as such, I'm the Coast Guard's Eleventh District Program Manager for Waterways Management which

includes vessel traffic systems. Previous to this job, I was Captain of the Ports of Los Angeles and Long Beach.

Along with me today is Captain Tom Robinson, who is the Captain of the Port of San Francisco Bay, and Commander Ed Rollison, who is the Commanding Officer of the Vessel Traffic System here in San Francisco.

We appreciate the opportunity to be here today, and I think we've heard many of the issues with vessel traffic services...(inaudible). I'd like to give you an update of where we are in the Coast Guard and what some of our plans are for vessel traffic services.

The packet that we gave Joy includes both the testimony and some information about local VTS, as well as some statistics on VTS use in the area.

VTS in San Francisco became operational in late 1972 with the purpose to reduce vessel collisions, rammings, and grindings, and ensuring environmental harm would be prohibited, and facilitate vessel traffic.

The three elements of the basic system which we have here are: Traffic Routing System; Communications Network; and Surveillance System. Presently, VTS performs its missions with a highly successful voluntary participation. It's almost 100 percent. During the fourth quarter of this fiscal year -- July, August, and September -- almost 24,000 transits were recorded with VTS, San Francisco's area of operation. For all of fiscal year '90, about 99,000. Since the service's establishment, there has been no serious collisions or groundings by participating vessels navigating the system. And although the basic requirements are met by this voluntary participation, VTS is evolving.

We have a regulation project right now nationwide which would require that VTS participation be mandatory, and that is, instead of an individual having the option of participating or not participating in the system, participation of the vessels would be mandatory. We expect this Notice of Rule Making will be published toward the end of this year or the first part of next year, and after we receive comments it could go into effect next summer or in the fall.

Now, if we have mandatory participation, that ensures that we have the ability to communicate our waterways management information, including Captains of the Port Orders, to waterway users through the VTS. Mandatory participation would require them to monitor radio frequencies and utilize specific traffic schemes. None of the existing Captains of Port directive authority would be changed by mandatory participation.

So right now, if there were a concern in San Francisco Bay, the Captain of the Port has the authority to close portions of the Bay or stop vessel traffic. To have that kind of control that would be necessary to take charge of any situation. The existing

VTS is a major form of communication to be able to do that now.

Another initiative which we have has also been addressed here and the concern for it, and that's to add both closed circuit television and radar coverage in San Pablo Bay and the Carquinez Straits. Currently, these areas are not covered by existing cameras or radar. And, since these areas are navigated by large ships carrying dangerous cargo, we think that coverage in these areas would be very important.

Now, both to monitor the transits and to improve surveillance right now we have a voice radio reporting in system in place, but we can't surveillance traffic in those areas. The process for the improved coverage has started when the Coast Guard went forward with our planning process. The local VTS unit has asked for increased coverage which as been staffed and sent forward to CG Headquarters where we expect it to be included in our planned acquisitions.

Along with that, of course, is the overall Port Needs Study which the Coast Guard is doing. There are 23 ports around the nation which have been identified by the Coast Guard to study. The study has been ongoing for some time now. The study people, who are from the Transportation Systems Center in Cambridge, Massachusetts, have been in this area -- San Francisco -- and down in Santa Barbara and in Long Angeles-Long Beach gathering the information. The study will identify the benefits and the costs and the type of VTS which would be needed in each of the major ports.

The study is required by law, and my understanding after talking with Captain McCarry, who is the Project Manager in CG Headquarters for the Coast Guard Study, that the report is due to the Secretary of Transportation in August this year and then to be transferred to the Congress, and then when it is sent to Congress it will be made available to the public.

Now, the combination of what we want to do here locally is to increase the radar and closed circuit television coverage, and what comes out of that study will probably form the basis for what the Coast Guard does.

I should say a couple of things. One is that the local legislation calls for Harbor Safety Committees. I think both in this port and the ports of Los Angeles-Long Beach there exists the center of those committees already and they have been very beneficial in resolving the local safety concerns for navigation.

And the other thing I'd like to address, just briefly, has to do with control. While we're going to go from voluntary participation to mandatory participation, control seems to get mixed up with participation, and the vessel systems get mixed up with Air Traffic Control systems. We believe the our primary purpose is to get all the people participating and then we'll be able to readily communicate all of the information that the vessels need to be able to take action to safely navigate. If it happened that during this process we would see a dangerous situation, we would be more

directive.

That authority already is available from the Captain of Port when there are VTS's. So I don't think there will be many situations where the person on the radar in our VTS will be giving right 10 degrees or the left 10 degrees. That's not the type of service we're talking about. So the CG VTS systems are not parallel with the Air Traffic Control Systems.

The increases we're talking about in coverage, the studies that are going on and the attention, of course, of this whole issue is being given nationally, will result with this country after a period of time having world class VTS's. I know both the Commandant and the Secretary of Transportation are looking at that. It's just a matter of where should they be and, of course, how will they be funded.

Thank you. I'll be glad to answer any questions.

CHAIRMAN MARKS: Thank you very much.

CAPTAIN CARD: If you have questions that I can't handle, I'm sure we have people who can, so...

SENATOR KEENE: (Inaudible)

CAPTAIN CARD: I think there's two parts to the question. I think one is that if somebody -- we had a mandatory participation system and someone didn't participate in it, what might we do? Of course, you know we also have in the area, in addition to this communications network, Coast Guard vessels at group in San Francisco. There are a lot of things they could do to get the attention of the vessel who wasn't participating.

SENATOR KEENE: If it doesn't participate, you give him that information?

CAPTAIN CARD: Right, right. You would give and get information. Now, again, depending if I -- each situation is different: what would come up, what kind of a navigational situation we'd come up with to see if we can handle it. But, right now, there is...(inaudible). This has been the 20th year -- the 18th year of there being a VTS here in San Francisco. The...(inaudible)...and Pilot's Association -- almost 100 percent participation. What we need, I think, then you would become more directive, I don't know. Maybe yet if you have any of those situations even now, could tell us what we did.

SENATOR KEENE: They don't make any profit...

MR. ED ROLLISON: (Inaudible)

SENATOR KEENE: (Inaudible)

CAPTAIN CARD: I guess in any of it, yes. Of course, the Inland Rules of the Road inside and the international rules on the high seas would always apply, and none of the things that we're doing change those. We won't have a hand on the engine order telegraph or the helm of the vessels out there, but I believe most of the large vessels

have pilots on board. It's a very cooperative system. I can't say there won't be...(inaudible)...record, but I think that by providing the navigator information, by being able to identify the vessels and providing them information about other vessels, we will be able to add waterway safety.

For example, if we have a situation where we know there's a problem up ahead, we can provide information for ships in the system for them to slow down or stop in certain areas so they don't aggravate the situation. But saying there's a problem here, this is going on here, you're going to have to wait for a while over here...

SENATOR KEENE: Let's go back to...(inaudible)

CAPTAIN CARD: I think in any navigation system more information about vessel location and movement has merit in helping to prevent the accidents. I don't know about the particular accident you are asking about. Would information from the improved VTS radar or TV screen be helpful in preventing the collision? I think there are several hypothetical questions you are asking.

SENATOR KEENE: Would you have had the information...

CAPTAIN CARD: I couldn't say we wouldn't, depending on how the coverage was arranged and how the radar systems were set up. We don't have a radar system out there right now. I would think with the kinds of systems available today we might be able to tell, but I guess you'd really have to see just what the system was and what the radar was showing and how that would be communicated to the ship and if it would be helpful. Obviously that's a concern, and as this new system is being designed, I think that probably will be taken into account. I would think that probably the technology exists that ought to be able to help identify location of the vessel in relation to the channel.

SENATOR KEENE: (Inaudible)... That part isn't hypothetical because it happened.

CAPTAIN CARD: Right.

CHAIRMAN MARKS: Thank you very much. Appreciate your being here.

Dr. Michael Herz.

MS. ANN NOTTHOFF: My name is Ann Notthoff. I'm with the National Resources Defense Council. And Michael Herz had to go out for a meeting and didn't how about this hearing until just recently, so he prepared some comments yesterday on behalf of both the NRDC and the Bay Keeper, and I'd like to present those today.

I'd like to say, for the record, that NRDC wasn't notified of this meeting which we're very interested in. We did produce a report last March about tanker safety in San Francisco Bay, Los Angeles, and New York Harbor. You gentlemen already have a copy of that. I'll be glad to make it available to the committee.

There's also a report that was released by the Center for Marine Conservation which details shipping safety in America's coasts, looks at right-of-ways issues, and had

some recommendations regarding VTS coverage along the coast out here that I will also make available to you.

First, let me just go over a little bit about what the Bay Keeper is and what NRDC is. Bay Keeper is a hands-on water quality enforcement and public awareness raising nonprofit organization. The programs are designed to supplement the activities of regulatory agencies, none of which currently has any regular on-the-water spill prevention presence, despite the mandate given them by existing environmental regulations. The Bay Keeper and its corps of trained volunteers patrol the Bay with boats, planes, and on foot to detect and document violations of environmental laws, and collect data to assist agencies and advocacy groups in bringing enforcement actions.

Since the middle 1970's, Dr. Herz has served on a variety of oil spill-related advisory committees for the National Research Council, the National OCS Advisory Board, the California Department of Fish and Game, and, most recently, he served on the Governor of Alaska's Commission on the EXXON VALDEZ oil spill and was part of a commission that produced the report. He also conducted a detailed report of the explosion, spill, and sinking of the tanker PUERTO RICAN which occurred just beyond the Golden Gate in 1984.

NRDC is a private, nonprofit environmental protection organization with offices through the country, which is supported by more than 130,000 members, and our staff of lawyers, scientists, and resource specialists have been deeply involved in offshore oil development and its problems in tanker traffic since the '70s. As I mentioned, we recently completed an evaluation of tanker and barge safety in three of American's busiest ports.

Receiving spilled oil from the marine environment is like trying to empty a swimming pool with an eyedropper: inefficient and ineffective. The American Petroleum Institute acknowledged that, and I quote, "No effective containment of such an EXXON VALDEZ size major spill has been accomplished." And the Government Account Office was told by the Coast Guard that, "With current technology, the best that can typically be expected after a major spill is to recover 10-15 percent of the oil."

Therefore, the goal must be preventing oil from reaching the marine environment in the first place. One of the most effective ways of accomplishing this is by evaluating the effectiveness of existing safety systems such as vessel traffic service systems which are capable of detecting potential hazards and intervening before catastrophes occur.

For example, the evidence indicates that the EXXON VALDEZ was beyond the VTS's radar range when it ran aground in Bligh Reef. The tanker PUERTO RICAN was similarly beyond the range of the San Francisco Bay VTS and inside the boundary of the Gulf of the Farallones National Marine Sanctuary, violating Coast Guard orders, when it broke

up and sank.

Testimony before the Alaska Oil Spill Commission by the University of Alaska Marine Advisory Service reflects the concern of many about the influence of vested interests in the regulation of the oil industry, and I quote, "The Vessel Traffic System needs to go through a very thorough external audit." And that's not done by the U.S. Coast Guard, not by the Alaska Department of Conservation, probably not by anybody in this room, but by people who have nothing to gain or lose by what they say.

In further testimony, the President of Arco Shipping suggested that even the oil industry itself believes that independent oversight is needed. The states must establish navigational safety advisory groups of people who live in the local areas that understand navigation and understand ship operations.

However, despite oil industry offers of major funding to support regional centers for responding to catastrophic spills, we have seen industry lobbyists opposing safety legislation both nationally in their opposition to double hulls and in California in their opposition to tug escorts for tankers.

Now that the Oil Spill Prevention, Abatement and Removal Act is law in California, we need to implement the strongest possible Vessel Traffic Service provisions to prevent collisions, groundings, near misses, and spills by oil tankers and barges. It's our Bay, and it needs to be managed for the benefit of all of its users.

We have a few recommendations here:

First, the Vessel Traffic Service system should be mandatory and empowered to direct vessels' movements to ensure safe operation. Such participation must include oil barges as well as tankers.

Second, radar coverage should be expanded to adequately cover the entire Gulf of the Farallones Marine Sanctuary, the area north of the Richmond-San Rafael Bridge along "refinery row" and beyond the Carquinez Straits, and then south to the Port of Redwood City.

Third, the use of satellite tracking systems, transponders, and closed circuit television surveillance systems should be explored to monitor and control vessel locations along the coast beyond the VTS range. Vessels with poor operational or mechanical histories should be required to utilize such equipment or risk being prohibited from entering San Francisco Bay.

Fourth, mandatory vessel traffic lanes should be extended beyond the current Separation System at the Pilot Station. Such lanes should be located from 25 to 50 miles offshore to reduce the risk of oil damage to sensitive coastal habitats. Arco recently voluntarily agreed to keep its vessels 100 miles offshore from Alaska to Los Angeles.

Fifth, funding for such improvements and modifications of the VTS should be

accomplished by a per-barrel tax based upon the quantity of oil moved in and out of the Bay. Funds should be levied and collected by the State.

Sixth, oversight and evaluation of this revised VTS system should be exercised by an advisory committee, the majority of which are private citizens who are not employees of oil companies, shipping companies, or government agencies. True protection can be achieved only with citizens whose only vested interest is in the protection of the public trust resources which they own.

Thank you.

SENATOR MARKS: Thank you very much.

That completes the testimony of those that were on the agenda. If anybody else wishes to testify at this time, we'd be glad to hear from you.

If not, I think it's been a very good hearing. We've got some ideas as to what should be done to help in the prevention of oil spills disasters as designed to be helped by the bill that Senator Keene authored. And I appreciate the opportunity of having everybody here and appreciate the opportunity of listening to you.

Any suggestions you have to make that you've not given us here today, please furnish them to us through copies of any testimonies you have in addition to calling the Senate Committee on Maritime Industry.

Thank you very much. Appreciate your being here.

No further testimony, we'll adjourn the hearing.

Thank you.

--ooOoo--

Presentation of the Department of Fish and Game
to the
Senate Select Committee on Maritime Industry
Tuesday, November 13, 1990

Mr. Chairman, Members

I am Mr. Ed Willis, Acting Deputy Administrator, for Oil Spill Response.

Thank you for providing me the opportunity to testify today.

The Department of Fish and Game has the primary responsibility for implementing Senate Bill 2040, the Lempert-Keene Oil Spill Prevention and Response Act. With the passage of this landmark legislation, the state has the authority and resources to effectively prevent and respond to oil spills. Since I am sure you are aware of most of the bill's provisions, I will not discuss the bill as a whole, but I will provide some detail on the Department's role in improving marine safety.

Given the difficulties of effectively responding to oil spills, the legislation places heavy emphasis on prevention. To reduce the possibility of shipping accidents, the Department was given a significant role in promoting marine safety. Specifically, the Department will be involved in the following areas:

- Promoting the adoption by the Federal government of certain safety equipment.

- Mandating in some circumstances tug escorts for tankers who are entering or leaving the harbors of the state.

- Evaluating the vessel inspection program of the United States Coast Guard. The Department may begin a state tanker inspection program if it is determined the federal program is inadequate.

- Determining the adequacy of programs and equipment for responding to disabled tankers.

- Implementing the recommendations of the harbor safety committees which are created by the bill.

- Reviewing the procedures and guidelines for pilotage in the state.

Lastly, the legislation gives the state a significant role in the development of a Vessel Traffic Services System in California.

The bill requires the Department, through the Office of Oil Spill Prevention and Response, to negotiate an agreement with the Coast Guard by December 31, 1991 for a VTS System to protect the harbors of the State. If the office administrator cannot successfully negotiate an agreement, the administrator shall, in consultation with the Coast Guard, develop a plan for the state's implementation of vessel traffic services systems. The plan shall include the harbors of San Francisco, San Pablo and Suisun bays, Los Angeles/Long Beach and any other areas where the Coast Guard recommends establishing a VTS System.

The plan would also specify a method for funding the implementation of a VTS system. The legislation grants the maritime industry six months to agree on a voluntary funding system to implement the plan. If the maritime industry cannot agree on funding, then the legislation directs the administrator to assess a fee on the maritime industry.

With the plan completed and funds available, the state will be in a position to ensure that the state's harbors are adequately protected. However, the legislation directs the Department to work very closely with the Coast Guard. All systems that are financed by the state are to be operated by the Coast Guard.

The Department recognizes the importance of VTS systems and is aware of the tight deadlines for implementing this section of Senate Bill 2040. The information you will be presented during this hearing will be very helpful to the Department in planning our marine safety program. We hope to begin meeting with the Coast Guard, and other interested parties soon.

I would be happy to answer any questions you have either about the state's role in VTS system development or the Department's implementation of Senate Bill 2040.

STATE OF CALIFORNIA GEORGE DEUKMEJIAN, *Governor*

BOARD OF PILOT COMMISSIONERS FOR THE BAYS OF SAN FRANCISCO, SAN PABLO AND SUISUN
WORLD TRADE CENTER, ROOM 339
SAN FRANCISCO, CALIFORNIA 94111
TELEPHONE: 397-2253

November 13, 1990

California Legislature
Senate Select Committee on the Maritime Industry
Senator Milton Marks, Chair

Attached for the hearing on implementing the Vessel Traffic Service provisions of the California Oil Spill Prevention, Abatement and Removal Act is the testimony of Rear Admiral Thomas J. Patterson, President, Board of Pilot Commissioners.

November 13, 1990

Good morning Senator Marks. Once again we are encouraged and reassured of the interest by you and the Senate Select Committee in deep draft ship traffic in California waters including the Bays of San Francisco, San Pablo and Suisun and their tributaries leading to the Ports of Sacramento and Stockton.

The safety record on these waters, despite increasing and deeper draft vessel traffic, is in large part due to the round-the-clock vigilance of the military and civilian personnel at the Vessel Traffic system. They have a close working relationship with the skilled and experienced pilots licensed by the Board of Pilot Commissioners. We are informed that these pilots rely heavily on the services provided by VTS to ensure safe vessel movements.

The VTS provides to the pilots current, accurate, and continuous information not otherwise available. This system expands the pilot's geographical range of knowledge essential for safe navigation. The VTS permits the pilot to disseminate information regarding his ship for the benefit of other ships and shore stations.

The Board of Pilot Commissioners highly endorses the VTS and the role it will play in the Harbor Safety Plans to be prepared by the Harbor Safety Committee.

A smoothly coordinated program melding the existing, proven systems and organizations with the provisions of the Oil Spill Prevention, Abatement, and Removal Act is essential. As a governmental agency with some responsibility for the safety of commercial vessel activity on these waters, the Board of Pilot Commissioners pledges its full cooperation and assistance to this priority program.

We recommend in the best interest of communications and coordination that a representative of the Board of Pilot Commissioners be assigned to the Harbor Safety Committee for San Francisco mentioned in Article 3, Section 8670.23, Page 34

Under Section 8670.24, Page 38, where it states that the Administrator shall evaluate all pilotage areas, this Board looks forward to fully briefing the Administrator and assisting in the evaluation of the areas of licensing, investigation of pilot incidents, and pilot training. In the latter, we are pleased to report that we are expanding pilot training to include refresher training for all serving pilots holding state licenses.

The first phase will train fifty-six Bar Pilots and a small number of inland pilots at the Port Ravel facility in Grenoble, France. This one-week training course will start in late spring 1991 and take approximately twenty-four months to complete. A $50.00 surcharge is being charged for each ship movement to fund this phase of the long range training program.

In summary, the Board believes that qualified, experienced and constantly trained pilots, working with the VTS, will continue to be a major contributor to marine safety. Our recommendation is to retain and expand the present VTS in San Francisco. One extension to evaluate would be to move the coverage north to include up to the Southern Pacific railroad Bridge just north of Benicia. This is a critical passage for both up- and down-bound ships.

Finally, while tankers and tanker barges are the focus in this new and important legislation, we must always remember that all vessels of all types require marine safety and eternal vigilance.

I thank you for this opportunity to comment for the Board of Pilot Commissioners.

Sincerely,

Thomas J. Patterson

Thomas J. Patterson

STATEMENT OF PMSA

NOVEMBER 13, 1990 SENATE INTERIM HEARING

I AM MORRIS CROCE REPRESENTING PMSA. THE PACIFIC MERCHANT SHIPPING ASSOCIATION (PMSA) IS THE ONLY REGIONAL MARITIME ASSOCIATION ON THE WEST COAST, REPRESENTING 43 OCEAN CARRIERS, BOTH CARGO AND TANKER OPERATIONS, WITH VESSELS CALLING ON THE WEST COAST.

IN THE SAN FRANCISCO BAY AREA, THE U.S. COAST GUARD RUN VESSEL TRAFFIC SERVICE (VTS) HAS BEEN AIDING VESSEL NAVIGATION SINE 1973. PMSA HAS LONG SUPPORTED THIS ACTIVITY. IN 1983, WHEN THE U.S. COAST GUARD ANNOUNCED, AS PART OF ITS FUNDING CUTBACKS, IT WAS CLOSING THE VTS, PMSA RESPONDED IMMEDIATELY AND HELPED FORM THE COALITION TO SAVE THE VTS. THIS COALITION SPEARHEADED A "FULL COURT PRESS" TO PREVENT THE VTS'S CLOSURE. IT DID MORE, HOWEVER, THAN SIMPLY CREATE PUBLIC PRESSURE. IN A PERIOD OF 6 MONTHS, IT RAISED, ON A VOLUNTARY BASIS, OVER $190,000 TO FINANCIALLY SUPPORT VTS. BY PUTTING OUR "MONEY WHERE OUR MOUTH WAS", WE DEMONSTRATED BEYOND ANY DOUBT THE VALUE WE PLACE ON THE U.S. COAST GUARD VTS HERE IN SAN FRANCISCO.

DURING THE MOST RECENT LEGISLATIVE SESSION, PMSA ONCE AGAIN PLAYED AN ACTIVE ROLE IN SUPPORTING VTS. THE PORTION OF THE LEMPERT-KEENE-SEASTRAND OIL SPILL RESPONSE ACT, WHICH ADDRESSES VTS,

INCLUDES SEVERAL POINTS SPECIFICALLY RECOMMENDED BY PMSA. THOSE INCLUDE:

1. THE STATE ADMINISTRATOR (A NEW POSITION CREATED BY THE ACT) MUST WORK WITH THE USCG IN DEVELOPING ANY VESSEL TRAFFIC SYSTEM.

2. IF THE ADMINISTRATOR CANNOT NEGOTIATE AN AGREEMENT, HE MUST, IN CONSULTATION WITH THE USCG, DEVELOP A PLAN FOR IMPLEMENTING A VTS BY DECEMBER 1992 WHICH IS TO BE RUN BY THE USCG BUT FUNDED EITHER VOLUNTARILY OR THROUGH A REVENUE FUNDED SYSTEM WITHIN THE STATE AND SUBMIT LEGISLATION TO DEVELOP A STATE FUNDED VTS PROGRAM.

3. THE ADMINISTRATOR MUST CONSIDER THE RECOMMENDATIONS CONTAINED IN THE HARBOR SAFETY PLANS AS PREPARED BY THE HARBOR SAFETY COMMITTEES.

4. IT WAS THE INTENT OF THE LEGISLATURE THAT ANY VTS BE OPERATED BY THE USCG AND THAT THE STATE SHOULD DEVELOP AND OPERATE SYSTEMS ONLY IF THE FEDERAL GOVERNMENT HAS NOT EXPEDITIOUSLY FULFILLED ITS RESPONSIBILITIES.

THE CRUCIAL ELEMENT WE INSISTED UPON WAS THAT THE U.S. COAST GUARD OPERATE ANY VTS DEVELOPMENT SYSTEM, EXISTING OR NEW. WE ALSO WANTED TO EMPHASIZE THE IMPORTANT ROLE OF THE NEWLY CREATED HARBOR

SAFETY COMMITTEES. THESE COMMITTEES, WHICH WILL CONSIST LARGELY OF MARITIME EXPERTS FAMILIAR WITH THEIR RESPECTIVE HARBORS, SHOULD BE THE FOCAL POINT FOR COMMENTING ON THE ADEQUACY OF EXITING VTS OR THE NEED FOR NEW SYSTEMS.

SPECIFICALLY, WITH REGARD TO THE SAN FRANCISCO BAY REGION, WE ARE SUPPORTIVE OF THE USCG'S DESIRE TO EXPAND THE PRESENT SYSTEM TO PROVIDE COVERAGE OF SAN PABLO BAY AND CARQUINEZ STRAITS. WE RECOGNIZE THIS IS A BUSY WATERWAY, PARTS OF WHICH ARE QUITE NARROW, TRANSITED BY DEEP DRAFT VESSELS, MANY OF WHICH CARRY HAZARDOUS MATERIALS. WE BELIEVE THAT THE USCG, AS PART OF ITS NATIONWIDE VTS STUDY, AS MANDATED IN THE FEDERAL OIL POLLUTION ACT OF 1990, WILL FORMALLY RECOMMEND THIS EXPANSION. THIS FEDERAL STUDY IS REQUIRED TO BE COMPLETED BY AUGUST 1991 - JUST 9 MONTHS FROM NOW. IT IS EXTREMELY IMPORTANT THAT ANY ACTION AWAIT THE OUTCOME, AS NATIONAL UNIFORMITY FOR VTS IS CRITICAL.

WITH RESPECT TO THE FUNDING ISSUE, WE SUPPORT THE USCG CONTINUED FUNDING OF VTS, INCLUDING THE COST OF ANY EXPANSIONS. WE RECOGNIZE, HOWEVER, THAT GIVEN THE FEDERAL DEFICIT SITUATION, SUCH FUNDS MAY BE DIFFICULT TO OBTAIN. THE ACT RECOGNIZES THAT AND SUGGESTS A VOLUNTARY FEE SYSTEM. WHILE THIS PERHAPS SOUNDS LIKE A GOOD IDEA, WE DOUBT THAT A VOLUNTARY SYSTEM WILL WORK. THERE WILL ALWAYS BE SOME CARRIERS WHO WILL NOT PAY THEIR FAIR SHARE. THIS WILL EVENTUALLY CREATE A SHORTFALL IN RECEIPTS THAT WILL REQUIRE THE "GOOD GUYS" TO COVER THE SHORTAGE. IT WOULDN'T BE TOO LONG

BEFORE NO ONE IS PARTICIPATING IN THE VOLUNTARY FUNDING AND THUS IT WILL COLLAPSE.

WE ARE THUS LEFT WITH THE FINAL ALTERNATIVE IN THE ACT, OR A STATE MANDATED USER FEE. WITH THE UNDERSTANDING THAT FUNDS GENERATED BY THIS FEE ARE USED ONLY FOR VTS, PMSA WOULD AGREE WITH SUCH AN APPROACH.

WE APPRECIATE THE OPPORTUNITY TO COMMENT ON THIS IMPORTANT SUBJECT.

Senator Marks, members of the Maritime Committee and distinguished guests and visitors:

I am here as President of the San Francisco Bar Pilots. As most of you know, the pilots have provided piloting assistance to vessels transiting the Golden Gate since the mid-1830's.

Despite a major revolution in technical improvements in ship design, propulsion systems and navigational aids, there remain substantial problems in safely moving vessels through the Golden Gate and through the waters of the San Francisco Bay region.

The modern commercial vessel is faster, heavier, deeper and less maneuverable than its predecessors. Such ships are difficult to maneuver at slow speeds, especially in the confined and shallow waters of the San Francisco Bay region. The traditional nemesis of navigators, strong winds and currents, still play a capricious role in safe vessel movement. Although modern radar has had a tremendous influence on the safe movement of vessels, fog continues to be a serious factor in such movements. The tragic collision of tanker GOLDEN GATE and the fishboat Jack Junior off Point Reyes in 1986 is but an example of when shipboard radar can prove to be a false friend.

Large commercial vessels which are restricted to relatively narrow channels must compete for water room with fleets of recreational vessels and fishing boats, as well as other commercial vessels. Moreover, shipboard systems, while generally excellent, are not always reliable. For example, in 1988, the tanker ARCO JUNEAU collided with the Carquinez Bridge. An ensuing investigation revealed that the onboard radars were not

properly calibrated and the ship was 200 feet from where the radar plots showed it to be.

What experience has taught us is that for proper and safe movement of vessels we need, in addition to competent crews, navigators, seaworthy vessels, and pilots and VTS working within a positive control system. VTS supplies that important role. VTS provides positive information so that vessels are kept safely separated from each other and maintains the course and track of vessels as they proceed through these waters.

Nowhere was the importance of VTS best revealed than in the 1971 collision of two Chevron tankers at the Golden Gate. That collision occurred despite the fact that both ships had competent masters who worked for the same company and both had working bridge-to-bridge communication systems and onboard radar. However, at that time neither vessel was operating under a positive control system and both proceeded with the expectation that the other vessel would give way. Their joint mistake proved to be an environmental disaster.

VTS is not an infallible system, but its record over the past two decades is impressive. Since its full scale adoption, there have been no serious collisions in these waters between VTS-controlled vessels.

How effective is it is perhaps best made clear by a situation which arose about a year-and-a-half ago. A vessel being advised by a San Francisco Bar Pilot operating with VTS was surprised by a vessel which refuses to use local pilots and whose master was not in communication with VTS. The situation was saved by a warning call to the pilot from

VTS which reported the unidentified vessel bearing down on him. Because VTS recognized the threat that the unidentified vessel presented to the pilot and gave an adequate warning, the pilot was able to take effective measures to avoid a collision. This incident tells me that VTS plays a very important role in accident prevention, and, in this case, I think it can be safely said that a serious casualty was avoided by VTS.

VTS is an expensive system, but it must also be said that its cost has been offset many times over by the environmental and property losses which would have occurred but for its intervention. For that reason, any plan involving marine safety must include a fully-functioning VTS system. This fact is most clear to those who use it on a daily basis, the men and women of the San Francisco Bar Pilots.

Having said that, I must also express the concern that all members of the San Francisco Bar Pilots have felt when VTS has been subject to budgetary attack. VTS is clearly a local system. While its benefits extend nationwide, its most telling benefits are on a local level. For the past two decades, the Coast Guard has been faced with fluctuating budgets. Many of these budgets have threatened to trash VTS in the interests of Federal budget considerations. such attempts have so far been beaten back by an unusual coalition of industry, labor, pilots, and environmentalists. However, recognizing how significant VTS is to safe navigation, we at the State level cannot sit back and idly expect Uncle Sam to continue to bail us out. We must be prepared with a plan to address this issue and be prepared to take over the system if the Coast Guard is faced by budgetary constraints to back away.

We all know the Coast Guard has been given a potpourri of missions. Its budget has been cut and pasted to fill immediate needs and concerns. In this environment the emphasis on marine safety has swung back and forth like a pendulum. Such adjustments may be appropriate on the national level, but we cannot afford to have local maritime safety imperiled by such considerations.

We believe that the role of VTS should not only be preserved, but expanded. We feel that all commercial vessels should be required to utilize the system. In other words, participation in the system should be mandatory and not merely voluntary. Secondly, we believe that technical improvements should be considered and developed, including perhaps the use of transponders on vessels which would identify the vessel and its speed and heading on the VTS radar in much the same way air traffic control systems operate.

Perhaps most important of all, we think that serious consideration should be given to either the State of California or a private organization taking over VTS. In fact, so strongly are we concerned about preserving the system that we at the San Francisco Bar Pilots would be willing to give serious consideration to taking over and operating the system ourselves. We are, after all, the primary users of the system and the people who are most directly affected from the standpoint of our careers by a properly functioning VTS system. What we would propose in that instance is to replicate to a large degree what has been done by the pilots in Rotterdam and other locations around the world where VTS systems are directed and operated by the local piloting organization. Having the pilots take the system we think would be relatively easy since pilots are well trained and knowledgeable both about the local waters and vessel communication needs and are also competent and qualified radar operators.

The system could be paid for in much the same way that pilotage tariffs are billed and paid. In essence, this would be a user supported system which industry would pay for based upon the number and size of its vessels and how often they operate in these waters.

While we have not fully considered a full operating plan nor an operating budget, we believe, based on the Coast Guard model, that such a system could be effectively operated. We would anticipate working out an integration agreement with the Coast Guard which we assume would still retain its role as a rescue system. Provision would have to be made for collection of tariffs from vessels which do not utilize pilots and from governmental vessels. Such a system we would envision would utilize a single pilot as officer in charge and two to three radio/radar operators who would also serve as dispatchers for the San Francisco Bar Pilots. Such an arrangement we believe would assist in the proper dispatch of vessels, but most importantly would ensure that vessels were being monitored by competent shipmasters with local knowledge of the waters who can anticipate problems and advise vessels before those problems become unavoidable. Because we anticipate running this operation on a public utility basis, we would anticipate needing some form of limitation of liability which would protect our association from expensive lawsuits that might arise. Our concern is not so much the liability for such litigation, but the costs of having to deal with it. So far the VTS system to our knowledge has been able to remain relatively suit-free, which is not merely a credit to the fine men and women who have operated it, but also to the fact that the limitations on suing the Federal government in such areas have proven to be effective obstacles.

VTS is not a substitute for competent vessel operation. It does, however, provide

an additional source to the individual vessel operator or pilot. It can help him identify different courses of action and it can assist him by directing other vessels away from him. We believe whoever runs VTS, whether it be the Federal government, the State government, or a private organization such as the San Francisco Bar Pilots, it must be maintained and improved upon. The safety record that we enjoyed over the past 20 years owes a great deal to VTS. We want to see that system continue, and, whatever system is evolved, we want to play a part in its operation so as to insure that it is the most effective system available.

TESTIMONY OF

CAPTAIN OLIVER F. WILLIAMS

SENIOR ADVISOR MARITIME AFFAIRS, ARCO MARINE, INC.

before the

SENATE SELECT COMMITTEE ON MARITIME INDUSTRY

CALIFORNIA LEGISLATURE

on

IMPLEMENTING VESSEL TRAFFIC SERVICE (VTS) PROVISIONS OF THE CALIFORNIA OIL SPILL ACT

SAN FRANCISCO, CALIFORNIA

NOVEMBER 13, 1990

Good morning Mr. Chairman and Committee members. My name is Captain Oliver Williams. I am a graduate of the California Maritime Academy and have spent all of my professional career in Marine Transportation. I am currently Senior Advisor Maritime Affairs for ARCO Marine, Inc. a wholly owned subsidiary of Atlantic Richfield Company.

ARCO Marine owns and operates ten U.S. flagged tankers ranging in size from 70,000 to 265,000 deadweight tons. These vessels are employed in transporting of north slope crude from Valdez to the west coast, and make about 145 port calls per year to California ports. We at ARCO are very proud of our safety and environmental record in operating these vessels.

I estimate that 90 percent of all Marine accidents are caused by human failure, and most of these accidents occur in harbors or in the approach to the port. A Vessel Traffic Service (VTS) that is professionally operated with state of the art equipment, and with mandatory vessel participation and when necessary mandatory vessel control, would contribute to making vessel traffic safer in our ports.

There is some resistance in the marine industry to supporting VTS systems that would include mandatory vessel participation and mandatory vessel control. This dates back to the Maritime tradition that the Master of the vessel answers to no one. This must and will change. The bridge team concept where everyone contributes to the operation of the vessel must be used, and mandatory navigation commands by a Vessel Traffic Controller would be part of this change.

I testified in July this year before the U.S. House of Representatives Subcommittee on Transportation, Aviation and Materials. In that testimony I pointed out that many ports in the world have Vessel Traffic Services that far exceed anything found in the United States. An excellent example of this is the Port of Rotterdam.

The Rotterdam VTS system has a network of 26 radars, and each radar has its own tracking system. The tracker calculates every three seconds and the data is sent by telephone line to the real-time computers in the traffic center. The computers combine the information from the different trackers into one picture on the control centers radar screens. Also raw radar video is transmitted by micro-wave and co-axial cables and is also shown on the radar screens.

Three coastal radio direction finders automatically pick up vessels reporting in by VHF radio, and the bearing information is sent by telephone lines to the traffic center. This makes it possible to identify vessels on the radar screen. They also use some television coverage, and the whole VTS system has an excellent VHF radio communication system.

The normal practice of the Rotterdam VTS is to provide information to the Captain or Pilot on the traffic situation, intentions of other vessels, the ships' position if necessary, and other relevant information. The Captain remains responsible for navigating his vessel, making use of the information provided. Under special circumstances the VTS control center will give binding orders to the vessel.

The San Francisco Bay Area now has a Vessel Traffic Service that is operated by the Coast Guard. This VTS offers a traffic routing system, a communications network and a surveillance system. Participation in the San Francisco VTS is on a voluntary basis.
The San Francisco VTS should be properly equipped and manned, and require mandatory vessel participation and when necessary, exercise mandatory vessel control.

There have been numerous incidents in San Francisco that have resulted in groundings, near misses between vessels, collisions and allisions, that could have been prevented by a VTS with mandatory vessel control. There must be a concerted effort by all concerned at improving the navigation of vessel in San Francisco, and a mandatory VTS would be a step in that direction.

The San Francisco VTS should have sophisticated equipment similar to that in Rotterdam, that would allow for communicating, tracking and controlling of vessels. The operators must be properly trained and maintain a good working relationship with their counterparts aboard the vessels.

The ports of Long Beach and Los Angeles have never had a VTS operated by the Coast Guard, nor do I believe that they now require one. Both the Long Beach and the Los Angeles pilot stations are radar equipped, and have historically assisted vessels entering or departing their harbors. This utilizes marine professionals assisting one another, pilots ashore assisting the vessels master and pilot.

The Long Beach/Los Angeles Marine Exchange, Port and Navigation Safety Advisory Group has been working for the last two years, on creating a Vessel Traffic Management System (VTMS) for the port. This Safety Advisory Group is comprised of representatives from the tug and barge, dry cargo vessels, and tanker industry; U.S. Navy, Coast Guard; and Port Authorities and Pilots from both Long Beach and Los Angeles.

This proposed Long Beach/Los Angeles Vessel Traffic Management System will include both port areas and a geographic area extending about 20 nautical miles seaward. There will be a VTMS Control Center at the Maine Exchange in addition to the two pilot stations. The primary responsibility of the VTMS will be information exchange with the vessels within their jurisdiction.

The VTMS will however, require vessel position reporting; a speed restriction not exceeding 12 knots in the Precautionary Area which is located outside the breakwater; a vessel separation in this Precautionary Area of 460 meters (1/4 nautical mile); and when entering the Precautionary Area the vessel must be on hand steering, with the Master on the bridge.

The differences in geographical complexity between San Francisco and Long Beach/ Los Angeles harbors would dictate that different levels of vessel traffic management are required in these ports. I believe that the Coast Guard VTS Ports Needs Study will also recommend different concepts for these ports. It is my understanding that this study will not be fully completed until early 1991, and not be made public until late 1991.

I believe that Vessel Traffic Services that are tailored for the location, are properly equipped and manned, can be a real contributing factor in reducing marine vessel casualties.

That concludes my formal remarks, Mr. Chairman. I would like to thank you on behalf of ARCO for the opportunity of appearing before your Committee today. I would be happy to answer any questions.

COMMENTS FOR SENATOR MARKS VTS HEARING
November 13, 1990 at 1030

Presented by Captain John G. Denham
Assistant Marine Superintendent
American President Lines, Co.
1800 Harrison Street
Oakland, California 94612

Historically American President Lines has supported the Vessel Traffic Service concept as a major factor in the promotion for increased vessel safety. When the government threatened to close the San Francisco VTS, the Marine Superintendent of APL, as Chairman of the Marine Exchange's Harbor Safety Committee, lead a delegation to Washington to save VTS. As I recall Senator Marks was part of the delegation that successfully changed the Secretary of Transportations plan.

During the past year APL has undertaken an extensive review of all its marine operations. Based on the results of seminars, workshops, interviews with all our ship's senior officers, and an extensive evaluation of our day to day at sea operations of our 23 U.S. flag container ships and 7 general cargo Ready Reserve Fleet vessels we operate for the government, we have re-affirmed that VTS is a significant factor in increasing the safety of harbor and coastal waters navigational safety.

We consider that VTS as a service, is an extension and tool of pilotage. We employ pilots to increase vessel safety, protect the public interest and increase the efficiency of our marine operations. The law of the sea requires that the person directing the navigation of the vessel must at all times keep a lookout, by all available means; VTS is one of those means.

We demand our officers, and pilots when employed, participate in traffic systems where ever available. It is good seamanship.

We feel that the service provided in the San Francisco Bay region is excellent and desire that it continue.

It is our opinion that the management of vessel movements is a matter requiring expert knowledge and experience by those involved in directing the operations. Pilot, marine operations management and wharfinger inputs must be closely coordinated if a vessel traffic system is initiated. However if a traffic service, such as we have now is continued, then only indoctrination and training need to be increased.

Although APL no longer regularly ply the route to Stockton or

Sacramento, our responsibility in managing and operating ships for the government can require us to transit the bays of San Pablo and Suisun again. Therefore we concur in the need to extend the radar coverage of VTS to those bays.

If we have an opportunity to increase the capability of the present service, it should be in the area of monitoring vessel movement and projecting their intended movements. We feel that it is within the state of the art to project the intended movements of a vessel within the present area of coverage. I.e., by electronic means, display in a fast forward scenario, the intended tracks and intentions of vessels and view what possible risks they might incur. This feature in VTS could alleviate many potential problems and markedly increase the margin of safety for vessel operations in congested waterways.

Finally, APL encourages the USCG to continue to fulfill their responsibility in the Ports and Waterways Act (provide and operate VTS) and the 1990 Oil Pollution Act. We believe that the service is excellent and therefore does not need to be fixed. We support an increase in area coverage, training and indoctrination, especially for the small boating public, and improved capability in the form of the proposed projected intended movement analysis.

APL is amongst one of the few remaining U.S. flag container ship operators in the bay area. VTS helps us compete. In almost every recent legislative act to improve the safety of waterborne commerce, our industry (which includes the bulk oil carriers from whom we purchase our fuel oil) has been required to pay more; we can only pass those costs on to our customers.

APL has undergone considerable cut-backs in order to remain competitive. As a result, we are extremely sensitive to any increases in operating expenses without commensurate revenue gains. In improving and refining the present VTS system, in order to raise the level of safe navigation in our bays and coastal waters, the factor of cost effectiveness must be seriously considered.

VTSMarks/11-13-90

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TESTIMONY PRESENTED AT A

HEARING

of the

CALIFORNIA SENATE SELECT COMMITTEE ON

MARITIME INDUSTRY

on

THE SAN FRANCISCO VESSEL TRAFFIC SERVICE

November 13, 1990 - San Francisco

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My name is Michael Herz and I am the San Francisco BayKeeper and Executive Director of the San Francisco Bay Delta Preservation Association. We are a high-visibility, hands-on water quality enforcement and public awareness-raising non-profit organization. Our programs are designed to supplement the activities of regulatory agencies, none of which currently has any regular on-the-water spill prevention presence, despite the mandate given them by existing environmental regulations. The BayKeeper and its corps of trained volunteers patrol the Bay with boats, planes and on foot to detect and document violations of environmental laws and collect data to assist agencies and advocacy groups in bringing enforcement actions.

Since the middle 1970s, I have served on a variety of oil spill-related advisory committees for the National Research Council, the National OCS Advisory Board, the California Department of Fish and Game and, most recently, the Governor of Alaska's Commission on the Exxon Valdez oil spill. I also conducted (with Dianne Kopec) a detailed report of the explosion, spill and sinking of the tanker Puerto Rican which occurred just beyond the Golden Gate in 1984.

I also am testifying today in behalf of the Natural Resources Defense Council (NRDC), a private nonprofit environmental protection organization with offices throughout the country, which is supported by its more than 130,000 members.

a project of the San Francisco Bay-Delta Preservation Association

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NRDC's staff of lawyers, scientists and resource specialists have been deeply involved in offshore oil development and its problems since the 70's and recently completed an important evaluation of tanker and barge safety in American ports, including San Francisco and Los Angeles.

Recovering spilled oil from the marine environment is like trying to empty a swimming pool with an eyedropper - inefficient and ineffective. The American Petroleum Institute has acknowledged that ". . . no effective containment of such a [Exxon Valdez-size, major] spill has been accomplished." And the Government Accounting Office was told by the Coast Guard that ". . . with current technology, the best that can typically be expected after a major spill is to recover 10 to 15% of the oil."

The goal must be preventing oil from reaching the marine environment in the first place. One of the most effective ways of accomplishing this is by evaluating the effectiveness ofexisting safety systems such as vessel traffic service (VTS) systems which are capable of detecting potential hazards and intervening before catastrophes occur. For example, the evidence indicates that the Exxon Valdez was beyond the VTS's radar range when it ran aground on Bligh Reef. The tanker Puerto Rican was similarly beyond the range of the San Francisco Bay VTS (and inside the boundary of the Gulf of the Farallones National Marine Sanctuary, violating Coast Guard orders) when it broke up and sank.

Testimony before the Alaska Oil Spill Commission by the University of Alaska Marine Advisory Service reflects the concern of many about the influence of vested interests in the regulation of the oil industry: "The vessel traffic system needs to go through a very thorough external audit. And that's not done by the U.S. Coast Guard, not by the Alaska Department of Conservation, probably not by anybody in this room, but by people who have nothing to gain or lose by what they say."

In further testimony, the president of Arco Shipping suggested that even the oil industry itself believes that independent oversight is needed: "The states must establish navigational safety advisory groups . . . of people who live in the local areas that understand navigation and understand ship operation."

However, despite oil industry offers of major funding to support regional centers for responding to catastrophic spills, we have seen industry lobbyists opposing safety legislation both nationally (double hulls) and in California (tug escorts for tankers).

Now that the Oil Spill Prevention, Abatement and Removal Act

is law in California we need to implement the strongest possible Vessel Traffic Service Provisions to prevent collisions, groundings, near misses and spills by oil tankers and barges. It's our Bay and it needs to be managed for the benefit of all of its users.

RECOMMENDATIONS

1. The Vessel Traffic Service System should be mandatory and empowered to direct vessel movements to ensure safe operation. Such participation must include oil barges as well as tankers.

2. Radar coverage should be expanded to adequately cover the entire Gulf of the Farallones Marine Sanctuary, the area north of the Richmond-San Rafael Bridge and beyond the Carquinez Straits (to include all of the oil refineries) and south to the Port of Redwood City.

3. The use of satellite tracking systems, transponders and closed circuit television surveillance systems should be explored to monitor and control vessel locations along the coast (beyond VTS range). Vessels with poor operational or mechanical histories should be required to utilize such equipment or risk being prohibited from entering San Francisco Bay.

4. Mandatory vessel traffic lanes should be extended beyond the current separation system at the pilot station. Such lanes should be located at least 50 miles offshore to reduce the risk of oil damage to sensitive coastal habitats. (Arco recently voluntarily agreed to keep its vessels 100 miles offshore from Alaska to Los Angeles.

5. Funding for such improvements and modifications of the VTS should be accomplished by a per barrel tax based upon the quantity of oil move in and out of the Bay. Funds should be levied and collected by the state.

6. Oversight and evaluation of this revised VTS system should be exercised by an advisory committee, the majority of which are private citizens who are not employees of oil companies, shipping companies or government agencies. True protection can be achieved only with citizens whose only vested interest is in the protection of the public trust resources which they own, can true protection be achieved.

SAN FRANCISCO BAY:

Aspects of Tankship Activity

Hugh P. Gallagher
Robert Stewart

THE SCENARIO

As the big tanker rounded the corner at Point Reyes, the Second Mate picked up the radio and called the USCG Offshore Vessel Reporting System to check in. The vessel was inbound from Alaska carrying crude oil for the refineries of the bay area. The vessel was 800 feet long, 106 feet wide and was drawing 45 feet of water. She was carrying 350,000 Bbls. (14,700,000 gal.) of crude oil at 15 knots across the North Pacific. The Second Mate was assisted on the bridge by a helmsman and on the bridge wing by a lookout.

The vessel reported in again to the Coast Guard radio as it passed the "N" buoy at the entrance to the Gulf of the Farallons. The mate indicated his speed of advance as well as his ETA at the pilot station. He also informed the pilot boat of their arrival time. The pilot would board at the "LNB." This is the buoy that marks the entrance to the San Francisco Bay shipping channels.

At the buoy, the large tanker will check out of the Offshore Vessel Reporting System and check in with the Coast Guard Vessel Traffic System. The Vessel Traffic System differs from the Offshore Reporting System in that much of the reporting area has radar coverage. In this way, the Coast Guard can not only keep continual radio contact with a vessel, but can also monitor their progress by radar. After slowing down to allow the pilot to board, the vessel turns slowly to the Northeast and begins to transit the San Francisco Bar Channel. This narrow channel is dredged and its depth maintained for use by large ocean going vessels. The pilot, the master, and the Second Mate constantly monitor the vessel's position and progress through this channel.

Once across the Bar, and past Mile Rock, the large tanker passes through the Golden Gate and under the Golden Gate Bridge. This area is filled with strong currents and requires all of the pilot's skill and attention to maintain the vessel's track. Once inside the bay, the tanker will turn south passing along the city front and under the Bay Bridge. Most large tankers take this route prior to going to a berth because they must lighter a portion of their cargo in order to transit the shallower channels of the North Bay.

The pilot advises the Master during the anchoring process and then departs the vessel as preparations are made for lightering. During this process, smaller vessels or barges will come alongside and take a portion of the large tanker's cargo load. Once the lightering process has been completed another pilot will join the vessel. The vessel will once again check in with the Vessel Traffic System concerning their intentions and route of passage.

Departing anchorage #9 , the vessel once again passes under the Bay Bridge, this time northbound. It must transit the narrow channels to the East of Angel Island as well as passing under the Richmond-San Rafael Bridge on its way towards San Pablo Bay. The vessel checks in with Vessel Traffic at both the Richmond Bridge and The Brother's Lighthouse prior to entering San Pablo Bay. At these points, the pilot and Captain are notified by traffic of any other shipping in their area. The transit of San Pablo Bay is difficult due to the silting that occurs in the channel area and the vessel's extreme draft.

Once the vessel passes over the Pinole Shoal, it must prepare to safely navigate the treacherous currents of the Carquinez Strait. In addition to the currents, the Carquinez Bridge presents a number of obstacles to the Captain and the Pilot on their transit. The vessel must be navigated to safely pass the bridge footings and also must be trimmed to pass under the bridge span. The final test of the Pilot's skills come in the docking maneuver. The large tanker must be slowed to reduce its momentum and then safely maneuvered alongside it's berth. Even with the assistance of tugs, the current, wind and mass of the vessel make this a hazardous task. Once the vessel is safely alongside the dock it will check out with the Coast Guard Traffic System and the Pilot will depart having completed his assigned duties. The vessel's crew will immediately begin preparing to discharge the cargo remaining in the tanks.

I. THE SHIPS OF SAN FRANCISCO BAY

A. TANKSHIPS

Tankships are vessels which are designed and constructed for the primary purpose of carrying bulk liquid cargoes. The concept of constructing specially designed tankships was created approximately one hundred years ago. A notable example of an early tankship is the still extant Falls of Clyde, a sailing vessel which is now a museum ship in Honolulu.

Although most tankships are designed to carry petroleum products, a wide variety of bulk liquids can be carried in specially designed tankships. As an example the Falls of Clyde carried molasses from the Hawaiian Islands to San Francisco. More recently the Angelo Petri was a tankship engaged in the carriage of bulk wine from the west to east coast of the United States. Presently there are tankships which carry essential vegetable oils (e.g. palm oil) and even bulk orange juice concentrate. This paper will be limited in discussion to those vessels devoted to the carriage of bulk petroleum products.

1. Tankship Construction

Tankships are normally constructed by use of the longitudinal method of construction. The frames or transverse members of the hull are of large dimension and are spaced at relatively large distances apart. These transverse frames are supported longitudinally by numerous fore and aft stringers which give the hull great longitudinal strength. Historically such longitudinal construction has been characterized by an absence of double bottoms. In fact, in a general sense the traditional style of tankship construction can be viewed as similar to that of a skin covered canoe or kayak. (See diagram 1)

The interior of the tankship hull is divided by bulkheads into a system of cargo tanks. Cargo is loaded into and discharged from the tanks via a system of piping. Pumps from shore provide the pressure necessary for loading cargo. Shipboard pumps are employed when cargo is discharged. The intricacy of the piping arrangement and the number of

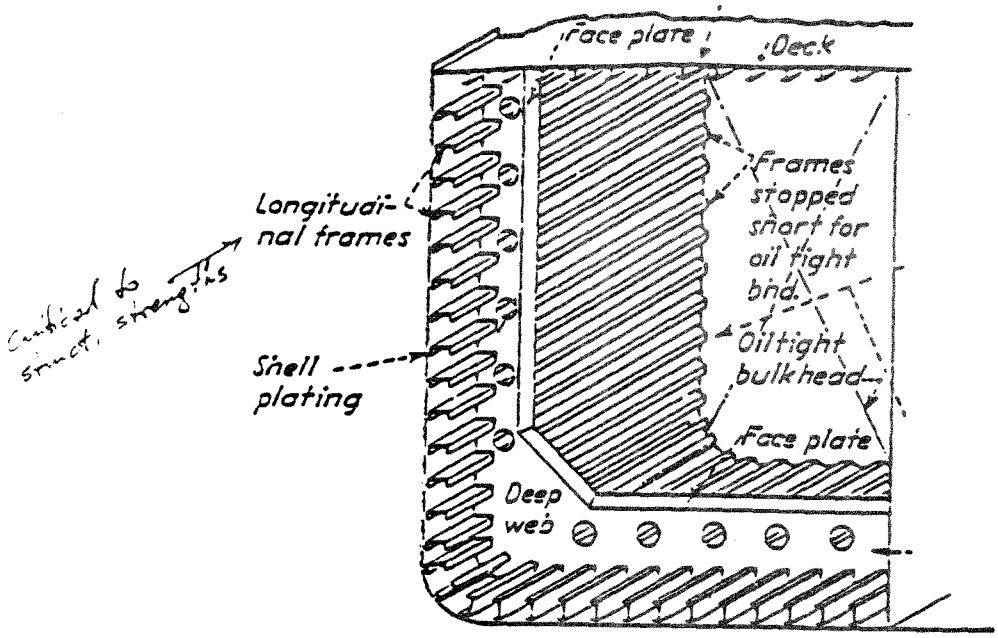

Diagram 1 . Sketch showing the longitudinal bracketless system

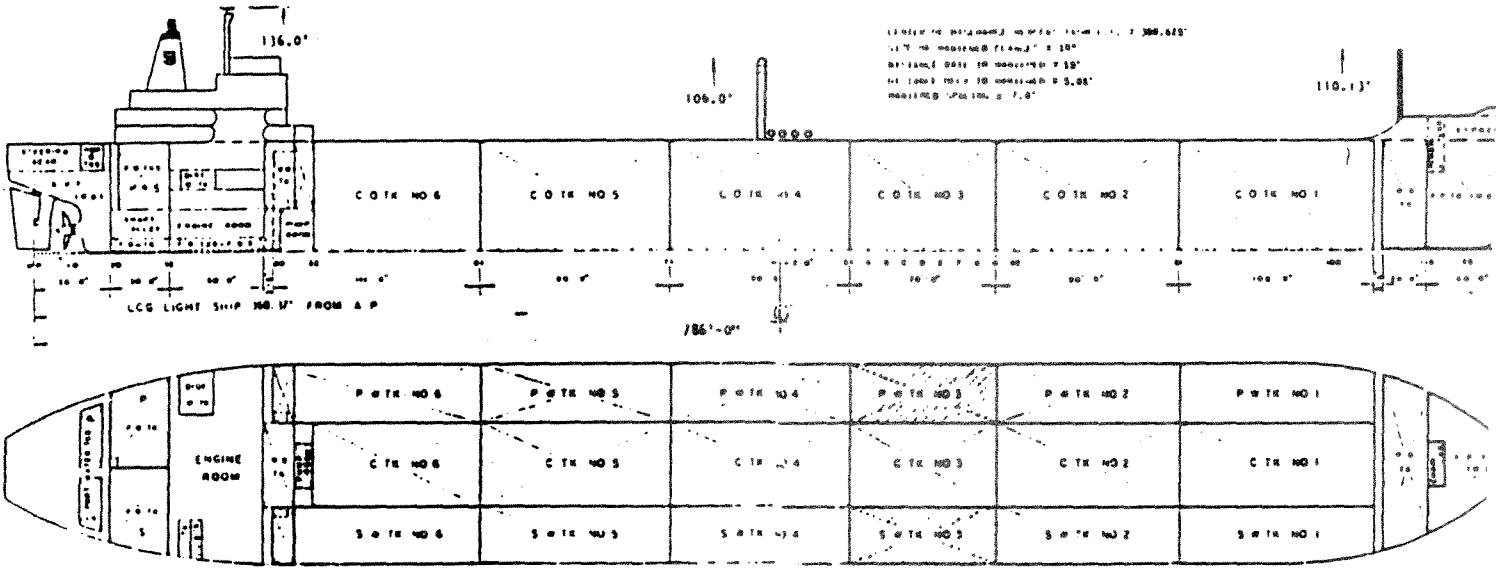

Diagram 2

pumps and tanks are functions of the service to which the tanker is intended. If the vessel is designed for homogeneous cargo (e.g. crude oil) then fewer tanks and pumps are provided. If the ship is designed to carry a variety of cargoes, to prevent contamination a greater number of tanks and piping "systems" is necessary to ensure segregation of the products carried. (See diagram 2)

2. Crude Oil Tankships

Crude oil tankships are vessels designed to carry entire cargoes of crude petroleum from its source to the refinery. Although they may be relatively small in size, more often they are large vessels ranging in size from 70,000 dead weight tons to 500,000 dead weight tons(dwt). Due to draft limitations the largest crude oil tankships cannot enter the bay. The largest vessels which can enter the bay are in the 150,000 to 170,000 dwt range. An example of this size vessel is the Exxon Benicia a 163,000 dwt. Even vessels of this tonnage must discharge a portion of its cargo to smaller vessels in the lower bay before its draft is light enough for the transit to upbay terminals.

3. Product Tankships

Product tankships are designed to carry a variety of petroleum product grades such as diesel fuel, JP-5, and heating oil. Essential to the product tankships mission is the segregation of cargoes to prevent contamination of the various products. As discussed before, the product tankship is characterized by greater intricacy of the piping systems to facilitate such segregation during loading and discharge. Product tankships are generally smaller in size than crude oil vessels. An example of a product tanker which frequents the bay is the Sierra Madre at 35,000 dwt.

4. Chemical Tankships

Chemical Tankships are similar to product tankers except that they often carry products of a highly refined nature such as toluene, glycol, styrene polymer, etc. Chemical tankers are similarly characterized by intricate piping systems to guarantee segregation and thus non-contaminations of the various cargoes. Examples of chemical tankers which are frequent visitors to the bay are the Marine Chemist and the Cornucopia.

5. Frequency of Bay Tanker Calls

Information provided by the Marine Exchange indicates that there were 1123 tanker calls in San Francisco Bay in 1989. Of these, 40 were chemical type tankships.

6. Hazards Presented by Tankship Traffic

The most obvious danger presented by oil and chemical carrying vessels transiting the bay is the risk of spillage of such cargo into

bay waters. A variety of accident-types may result in cargo spillage. Grounding, collisions, allisions and loading and discharge related accidents may all result in cargo being discharged into the water. These spills are often relatively small in size.

The greatest risk of spillage likely prevails during the loading or discharge operation. The most common cause of spillage during such operations is due to overfilling of cargo tanks during loading.

Collisions and allisions can result in large spills if one or more tanks are ruptured. In January of 1988 the Arco Juneau allided with the Carquinez Bridge ripping a 300 feet gash in the side of the ship and rupturing several tanks. Fortunately the vessel was light at the time of the accident and no spill resulted. In 1971 the sisterships Oregon Standard and Arizona Standard collide under the Golden Gate Bridge spilling 800,000 gallons of oil into San Francisco Bay.

Grounding may also result in large spills although the risk of a huge spill is unlikely as total destruction of the vessel is unlikely in protected bay waters. Double bottoms would likely eliminate most spills in bay waters caused by grounding. (Note that on exposed coasts where the force of the sea may cause the vessel to break apart double bottoms may be ineffective to prevent spills.)

Explosions may occur in tankships when explosive gases collect in empty tanks or cofferdams. Such explosions can be prevented by filling empty spaces with inert gases and USCG regulations require inert gas systems on tankers 20,000 dwt and larger. Notable tankship explosions of recent years are the Sansnena which occurred in Long Beach in December, 1976 and the Puerto Rican which exploded off the Golden Gate in 1984.

B. DRY CARGO SHIPS

Dry cargo vessel include ships designed to carry cargoes other than liquid bulk cargoes. Breakbulk, bulk, container, Ro/Ro and certain specialized vessels fall within this category.

Breakbulk vessels carry general dry cargo in all conceivable forms of packaging. Everything from bagged cereals to heavy machinery may be carried aboard these vessels. The breakbulk ship is the traditional dry cargo vessel and is characterized by the presence of self-loading booms.

Bulk carriers are vessels designed to carry full loads of dry bulk commodities such as grain, coal, and ore among others. The bulk carrier is usually not self unloading.

Ro/Ro ships (Roll-on/Roll-off) are vessels equipped with ramps and are specially designed to carry vehicles and/or trailers. An example of this type are vessels specially designed to carry automobiles. The automobiles are driven aboard at the port of loading and are driven off at the port of discharge.

Container ships are the dry cargo ships of the modern age and are rapidly replacing the old-fashioned breakbulk freighters. Container ships are specially designed ships which carry truck trailers in lengths normally ranging from twenty to forty feet. These trailers are removed from their chassis at the port of loading and placed aboard the vessel with a crane specifically designed to facilitate rapid loading and discharge. Container ships are usually deployed as part of an integrated land/sea intermodal transportation system.

1. Hazards Presented by Dry Cargo Vessels

Figures obtained from the Marine Exchange of San Francisco show that 2,326 dry cargo vessels called at ports within San Francisco Bay during 1989. Perhaps the greatest threat to the bay environment presented by these vessels is the risk of collision created by their numbers alone. These vessels in addition carry fuel oils, historically in double bottoms but now more commonly in wing tanks above the water line. An example of the quantity of fuel oil carried by a modern container ship is the 5,384 tons formerly carried by the Sea-Land SL-7 type vessels. Dry cargo vessel fuel oil could conceivably cause environmental damage if spilled as a result of collision or grounding. However, it is unlikely that all fuel would be discharged during such a mishap due to the unlikelihood of the destruction of all tanks.

C. TUGS AND BARGES

1. Types of Tugs

Tugs are the workhorses of the maritime industry and perform a variety of essential functions. These functions can be generally be divided into two categories, specifically ship assist and barge towing. Certain tug designs are suitable only for one function or the other. Other tug designs can perform both functions.

Ship assist tugs assist larger vessels during mooring operations. They can be used in a variety of positions to provide additional propulsive forces to assist vessels with limited maneuverability. In general, tugs are placed at the bow and/or the stern of the vessel being moored. The tugs are then maneuvered ahead or astern to either twist the larger vessel around a pivot point, to slow the larger vessel, or to breast the larger vessel alongside the wharf or pier. Tugs can similarly be used to assist larger ships in getting clear of a berth. Smaller ships will often employ a single tug at the bow. Larger vessels will use a tug at both the bow and stern. In some cases more than two tugs may be used.

Ship assist tugs range from single screw vessels of approximately 750 horsepower to twin screw vessels of 7,500 horsepower or greater. In addition, highly maneuverable "tractor" tugs have been developed in recent years. These tugs are capable of maneuvering in any direction within a 360 degree circle.

Barge towing boats may vary greatly in size and horsepower according to the service to which they are put. Small towboats devoted exclusively to bay towing of small barges may possess as little as 750 horsepower or less while large boats designed for ocean towing may have 9,000 horsepower or more. While many tugs may perform both barge towing and ship assist duties, those designed for towing are normally equipped with a towing winch to facilitate adjustment of the towing wire.

2. Types of Barges

The simplest form of barge is a floating platform upon which an object is secured for transport. Barges are used to transport machinery, large structural members, shipping containers, and dry and liquid commodities in bulk. Barges may range in size from under 100 feet in length to well over 400 feet.

Certain barges are designed specifically for the carriage of liquid cargoes in bulk. They are similar to tank ships in that they are designed with segregated tanks and pumps to discharge the cargo. Tank barges come in all sizes. An example of a large tank barge is the Crowley owned 450-6 at 148,000 barrels (approx. 22,000 tons).

3. Tank Barge Hazards

The hazards presented by tank barges are largely the same as those of tank vessels, i.e. collision, allision and grounding.

D. NAVAL SHIPS

The bay is frequented by a large number of naval vessels ranging from submarines to aircraft carriers. Certain naval vessels are devoted to the carriage of petroleum products in the form of various fuels and lube oils. The hazards presented by naval vessels are identical to those of their civilian counterparts. However, liability issues surrounding accidents involving naval vessels are within the purview of Federal liability statutes.

II. THE MARITIME PROFESSIONALS

A. THE PILOTS

1. General

Pilots are not members of a particular ship's crew under normal circumstances. Pilots are employed locally because they posses expertise in the areas of shiphandling and local knowledge.

Pilots are usually better equipped to handle a ship alongside her moorings because they handle various type of ship's daily throughout the year thus gaining far more experience than could the average shipmaster. In addition they are required to possess detailed knowledge of local conditions and the physical features of the port or ports in which they

work. Further, the working relationship between the pilot and local tugs is conducive to safe mooring operations.

2. Licensing of Pilots

The licensing of pilots is a subject upon which an entire paper might be written. It involves issues of federalism and the tension between state and federal jurisdiction. Generally speaking the federal government, through the US Coast Guard, licenses pilots who guide US flag vessels involved in coastwise trade. The jurisdiction of all other forms of pilotage is granted to the states.

The licensing dichotomy manifests itself strangely in the area of the review of professional errors by pilots. In a given collision US Coast Guard might have disciplinary jurisdiction over one pilot because the pilot was conning a US flag coastwise vessel. However, if the other vessel is of foreign flag or a US flag vessel engaged in foreign trade, the Coast Guard would have no jurisdiction. This even though state authorities usually require a US Coast Guard pilots endorsement as a prerequisite to state licensing.

The requirements for obtaining a US Coast Guard pilots endorsement include proof of experience and demonstration of local knowledge and other skills on a written exam. Experience is gained through making a minimum number of required observation trips through the area covered in the endorsement. A certain percentage of these trips must be made during hours of darkness. The written exam requires the applicant to place all hazards and aids to navigation within the endorsement area on a blank chart provided by the examiners.

In the San Francisco Bay Region ten observation trips are required to qualify to sit for a US Coast Guard pilot's endorsement for candidates holding an unlimited Master's license. (See below) Twenty-five percent of these trips must be made during hours of darkness.

State licensure as a pilot for San Francisco, San Pablo, and Suisun Bays requires possession of a US Coast Guard pilots endorsement for these areas as well as successful completion of a training program lasting up two years after selection. The selection and training of state pilots is administered by the San Francisco Bay Pilots' Association. The Pilot Association also dispatches the pilots to the vessels they will guide into the bay.

3. The Role of the Pilot

The pilot is employed as an expert in local knowledge and shiphandling by the ship. In San Francisco Bay such employment is compulsory for all foreign flag vessels and US vessels under registry (engaged in foreign trade). Although the legal role of a pilot is that of an advisor, in fact the pilot normally will conn the vessel to its berth giving all rudder and engine commands after boarding. In this rather odd relationship, the Master remains in command and may at any

time overrule any order given by the pilot.

B. SHIP'S PERSONNEL

1. Ship's Officers

Ship's officers are licensed personnel responsible for the safe navigation and engineering integrity of the vessel. Officers are licensed by an agency of the vessels flag government. In this country merchant marine officers licensing is the responsibility of the US Coast Guard.

Persons qualify for issuance of a licenses through a combination of proven experience or graduation from an accredited maritime academy and successful completion of qualifying examinations. In general licenses are issued as either deck or engineering.

Deck officers are responsible for the navigation and cargo operations of the ship. As an example, on a tankship the loading and discharge of the cargo is under the supervision of the deck officers. Engineering officers are responsible for the maintenance and operation of the ship's power plant.

The entry-level deck officer license is Third Officer or Mate. To qualify for this license, a candidate must have sailed in an unlicensed capacity for at least three years or graduated from a maritime academy of which there are five in the United States. In addition the license candidate must take a comprehensive three day examination in navigation, seamanship, safety issues, and applicable regulations among other subjects.

After an additional year's seatime a candidate may qualify for the examination for Second Mate. An additional year and the candidate may qualify for the Chief Mate's examination. The final step after a further year of seatime is qualification for the Master's license examination. Possession of a Master's license qualifies the holder to command a vessel. (All licenses discussed herein are unlimited, i.e. for vessels over 1600 gross tons.) (See diagram - for a facsimile of a USCG license.)

Engineering licenses generally parallel deck licenses beginning with the entry-level Third Assistant engineer level and culminating at the uppermost Chief Engineer level.

2. Unlicensed Personnel

Unlicensed personnel include all shipboard personnel excluding licensed officers. These personnel may be members of either the deck, engine, or stewards department.

Unlicensed members of the deck department are Able Bodied and Ordinary Seamen with Able Bodied Seamen being of greater experience.

FILE NO

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1 - 1

UNITED STATES COAST GUARD

MASTER

This is to certify that _____, _____

having been duly examined and found competent by the undersigned, is licensed to serve as Master of United States Steam or Motor Vessels of any Gross Tons upon Oceans.

RADAR OBSERVER, UNLIMITED (Endorsement expires 07/90)

for the term of five years from this date.

Given under my hand this 27th *day of* FEBRUARY, *19* 86.

SAN FRANCISCO BAY, CALIFORNIA
Port

S. W. MACKEY
S. W. MACKEY QMC / U.S. Coast Guard
By direction Officer in Charge of Marine Inspection

SN 7530 01 GF2 9450

These crewmembers do general maintenance work and handle lines during mooring operations. In addition, they stand helm and lookout bridge watches underway.

Unlicensed engine department members include oilers, firemen, wipers and qualified members of the engine department. These crewmembers assist engineering officers in the maintenance and operation of the ship's power plant.

Unlicensed stewards department personnel provide hotel services to other crewmembers such as food preparation and certain sanitary services.

3. Crew Organization

As discussed before, the crew of a merchant vessel is generally divided into three departments. These are the Deck Department, the Engine Department, and the Stewards Department.

As of the 1960's the average crew size of a merchant vessel was approximately 42 crewmembers. Presently that number is hovering around 21. In the near future it is likely that crew compliments may drop to as few as 12 persons. The following diagram shows the current typical organization of a modern tank vessel. (See diagram 33)

C. TUG PERSONNEL

Tugs are manned according to the service in which they are engaged. Ship Assist tugs will often have a compliment consisting of a licensed operator (Captain) and a deck hand/engineer. Oceangoing barge towing boats may have a crew of from 5 to 10 filling positions loosely analogous to those on large ships.

Tug operators usually possess licenses of limited tonnage. Such a license limits the size of the vessel the license holder may command. Common examples of such limitations are 200, 500 and 1,600 gross tons.

Tug operators usually begin to learn their trade as deckhands. Many have long experience in handling boats and barges of all sizes. Many pilots have a history of ship assist tug operation.

III. THE BAY

A. THE APPROACHES TO THE BAY

San Francisco Bay is a natural deep water estuary. It is that area through which both the Sacramento and San Joaquin rivers empty into the sea. These rivers and the cities that surround the bay itself have developed into a very sophisticated and complex center of commerce. The trade through the ports within the San Francisco Bay has naturally been broken down into two areas. The cities of San Francisco, Oakland and Richmond have developed dry cargo facilities in order to best serve

Diagram 3

Master*

Deck Department	Engine Department	Stewards Department
Chief Mate*	Chief Engineer*	Chief Steward/ Cook
Second Mate*	First Asst Engineer*	Asst. Cook
Third Mate*	Second Asst Engineer*	Messman
	Third Assistant*	
Boatswain/AB #1	Pumpman	
AB #2	Oiler #1	
AB #3	Oiler #2	
AB #4	Oiler #3	
AB #5		
AB #6		

their growing populations. The regions in the North Bay which are more sparsely populated developed their port and terminal facilities based on bulk liquid cargo rather than dry cargo. The bulk liquid cargo facilities require more land for storage and processing than was available in the cities of the central bay.

For the purposes of this paper, I do not intend to discuss the ports of San Francisco, Redwood City or the port of Oakland, except with respect to their shipyard facilities. I will limit my discussion to those terminals and facilities that handle liquid bulk cargo vessels. These vessels, commonly called tankers, carry a variety of cargoes into or out of the facilities of the North Bay. These vessels also use Anchorage #9 in the central bay for lightering or bunkering operations. These operations will be discussed separately.

B. TANKER PORTS OF THE BAY

1. Richmond

The largest liquid bulk transfer facility in Richmond is Chevron's Terminal. The Chevron wharf, known as the Long Wharf, is designed to handle both large crude carrying vessels and smaller product carrying vessels. The terminal is capable of handling a number of vessels simultaneously along the 1,660 feet of wharf. Loading or discharging operations are also capable of being completed simultaneously. The wharf is equipped with both loading arms and flexible hoses for ship to shore connections. The Chevron Oil Company maintains it's own fire and emergency crew within the refinery complex. Fires or other emergencies at the Long Wharf are the responsibility of this group. Tugs for ship assists or emergency towing are also available continuously within the Long Wharf facility. One limitation for vessels using this facility is the transit of Southampton Shoals Channel. The Channel is limited in both depth and width restrictions.

Orient Point is a 504 foot tanker facility located just to the North of the Richmond San Rafael Bridge on the east side of San Francisco Bay. This facility is not extensively used and is capable of handling only relatively small tankers. This product facility has a pipeline connection with the Chevron Refinery in Richmond. Fire and emergency services also originate from Chevron Richmond. The facility is not equipped with loading arms and uses only flexible hoses for ship to shore connections.

Point Molate is located just to the north of Orient Point. This facility is similar in size and capacity to Orient Point. This facility is owned and operated by the U.S Navy. It depends on the Richmond for fire and emergency services. Point Molate uses only flexible hoses for ship to shore connections.

Within the Richmond harbor area, there are a number of facilities. Union Oil's terminal is capable of handling both tankers and barges alongside. The dock is 736 feet long and equipped with oil booms at

both ends and loading arms for ship to shore transfer. ARCO's facility is south of Union oil on the harbor channel. This facility has 710 feet of dock space and is equipped with both loading arms and oil spill booms. On the Santa Fe Channel, there are a number of facilities for bulk liquid product transfer. Time Oil operates a facility with 260 feet of dock space. Texaco operates a facility with 635 feet of dock space and Burmah-Castrol operates a facility with 600 feet of dock space. All of these facilities are equipped with oil spill booms in racks on the ends of the docks.

The Richmond Terminal Agency operates two terminals within the Port of Richmond. Terminal #2 has 710 feet of dock space and Terminal #4 has 1,047 feet of dock space. Both of these facilities are operated for other companies and are capable of handling a variety of vessel and cargo types. Petromark also operates a terminal within the Richmond harbor. This facility is owned by the City of Richmond and handles petroleum at a 700 foot wharf.

2. Rodeo

The Union Oil Company of California operates a facility in conjunction with their refinery in Rodeo. This facility, at Oleum, is used for the product tankers and tank barges operating in coastal service. This facility has both loading arms and flexible hoses available for use in ship to shore connections. Fire and emergency services are supplied through the fire Department at the Union Oil Refinery. Oil spill booms are located at each end of the dock. Oleum is capable of handling two tankers loading or discharging simultaneously at the 1,250 foot wharf. In addition, each ship may be working a variety of cargoes.

The Sequoia Platform is an offshore structure located just to the south and west of the Oleum pier. Pacific Refining uses this facility mostly for the transfer of crude oil. Both foreign and American flag crude carriers call here to discharge cargo. The facility is connected to shore only by pipeline and all transfers of personnel or equipment are completed via launch service from the marina in Crockett. Firefighting capability is available on the platform in a limited fashion. The platform has 1,228 feet of berthing available with dolphins for mooring and oil spill booms at both ends.

The Wickland Oil facility is located just to the east of the Oleum terminal. This terminal has 980 feet of berthing space available and is equipped with oil spill booms at both ends of the dock. Fire and emergency services are provided by the Rodeo and Crockett Fire Departments.

3. Martinez

Ozol Wharf is located on the south side of the Carquinez Strait just to the west of Martinez. This is a small facility with no on site storage. The facility is capable of handling only a single small

product tanker at a time. Multiple cargoes may be loaded or discharged but this is also limited. The majority of the cargo passing through this facility enters a government owned pipeline servicing Travis Air Force Base. The Defense Fuel Supply Support Point operates this facility at the 270 foot wharf.

The Shell Oil Company operates a facility in Martinez that is capable of servicing both crude oil and product vessels. The terminal is capable of handling two vessels and multiple products simultaneously at the 900 foot wharf. The facility uses flexible hoses for ship to shore connections. The hoses are normally stored elevated in a hose rack for drainage purposes. Fire and emergency services are supplied through the Shell Oil Company Fire Department. Draft restrictions alongside are not normally a problem, but vessels arriving and departing must be capable of passing under the Carquinez Bridge and through the Pinole Shoal Channel.

Tosco operates two facilities in the Martinez area. These are Amorco and Avon. Amorco is located just downstream from the Benicia Martinez Bridge on the south side of the channel. The facility is capable of handling large vessels and multiple product transfers at the 978 foot wharf. The facility uses articulated steel loading arms for ship to shore cargo transfers, but additional cargoes may be transferred using flexible cargo hoses. Draft restrictions are not a problem, but as in the case of Shell Martinez, vessels must be capable of transiting the bay channels. Another problem that arises at Amorco is the tidal current on both the ebb and flood tides. The current at certain times of the year becomes extremely strong and can hamper vessels in docking or undocking situations.

Tosco's Avon facility is located on the upstream side of the Benicia Martinez Bridge on the south side of the channel. This facility is extremely limited in the type and size of vessel that it may service. All vessels arriving at this facility must first transit the Southern Pacific Railroad Span, this lift span bridge must be raised each time a vessel wishes to pass beneath it. The Avon facility has both articulated steel loading arms and flexible loading hoses available for ship to shore cargo transfer and is equipped with a total of 1,320 feet of berthing space. Fire and emergency services for both the Amorco and Avon facilities are provided by Tosco's Refinery Fire Department. Both facilities are equipped with oil spill booms at both ends of their respective wharves.

The other facility in Martinez is the Land-Sea Facility. This facility is located just on the upstream side of the SP Railroad Bridge on the south side of the channel. This terminal is capable of handling only one vessel at a time at their 970 Ft. berth. The facility is equipped with articulated steel loading arms for ship to shore cargo transfer. Vessels are limited in size at this terminal by the bridge span. Recently, I understand, the facility was purchased by Exxon and will be called Exxon East.

4. Benicia

On the north side of the channel in Benicia is the Exxon Corporation facility. This facility is divided into two separate terminals. The larger of the two is the crude oil discharging dock just downstream of the Benicia-Martinez Bridge. This facility is equipped with large steel articulated loading arms for ship to shore cargo transfer at the 1,100 foot berth. The fire and emergency services are provided by the Exxon Refinery fire department. The dock is also equipped with remotely operated fire monitors that can discharge water or foam. The water is drawn directly from the bay at dockside. Exxon also has an oil boom vessel standing by at their facility at all times and oil spill booms placed at each end of the dock. Exxon's second facility is located just to the west on the City of Benicia's wharf. This facility is used for the export of finished product. It is equipped with articulated steel loading arms for ship to shore transfer of cargo. The current along the face of both wharves can be very strong and many vessels elect to maneuver at slack water or only on the ebb tide.

5. Pittsburg

The Dow Chemical Company operates one facility in Pittsburg. The dock facilities are normally used for the transfer of chemical cargos. The 265 foot wharf is capable of handling only one ship at a time. Vessel size and draft are limited by both the SP Railroad Bridge and the Bay and Delta channel depths. The wharf uses both steel loading arms and flexible hoses for cargo transfer. Fire and emergency services are provided by the Dow Chemical facility fire department.

Two other petroleum facilities are operated in Pittsburg and these are both fuel piers. The PGE Fuel Pier has 700 feet of berth space and all services are provided by PGE. Crown Zellerbach Fuel Pier has 766 feet of berth space.

C. SHIPYARD FACILITIES

There are shipyard facilities in the City of San Francisco and the Port of Richmond. There are other small ship repair yards available in the bay, but the facilities in these cities are the only ones capable of handling large ocean going vessels. If a collision, grounding or major fire or explosion were to occur in the bay or anywhere on the central coast of California it is most likely that the vessels involved would be brought to these yards. Both of these facilities are capable of lifting ships using a floating drydock or doing alongside berth repairs. Oil pollution booms are available for use in both of these facilities in the event that a vessel is leaking while it is alongside.

There is also a Naval Shipyard and repair facility at Mare Island in Vallejo. Although this facility is not open to commercial vessels it is capable of handling most naval vessels including submarines. This

facility also has the ability to lift vessels using a drydock or do alongside repairs.

IV. MOORING OPERATIONS

A. UNDERWAY

1. Boarding the Pilot

In San Francisco Bay pilotage is compulsory for all vessels of foreign flag and all US flag vessel under registry (engaged in foreign trade). Coast wise vessels are not required to employ a pilot if the Master possesses a US Coast Guard pilots endorsement. Most vessels employ a pilot in any case because of the pilot's ship handling skills.

The pilot will board the ship via a rope pilot ladder at the San Francisco Large Navigation Buoy 11 miles from the Golden Gate. Once aboard the pilot will likely give all rudder and helm orders until the vessel is alongside her berth. The pilot will as well control the movements of the tugs that assist the ship in mooring.

2. The Bay Transit

As the ship proceeds up the bay to her berth, the compliment on the bridge will likely include the Master, the pilot, a deck officer, and a seaman steering at the helm. At night or during restricted visibility a supplemental lookout will be assigned to the bow or bridgewing.

In clear visibility the bay transit is often made at sea speed, with vessel being slowed in event of traffic, navigation hazards, or the possibility of wake damage requires. In restricted visibility vessels are commonly operated at "maneuvering speed," a speed at which the engines may be maneuvered at will. Maneuvering speed for many vessels is approximately 12 knots.

B. ALONGSIDE

1. Vessel Maneuvering Characteristics

As might be expected, large ships are not highly maneuverable. However, with consideration of the vessels maneuvering characteristics, tidal and meteorological phenomena and proper use of tugs, even the largest ships can be moored safely.

Most merchant vessels (including tankships) are of single screw propulsion. These vessels are maneuvered by either directing propeller wash against the rudder when going ahead, or by the force of water pressure against the rudder when making sternway. Thus the rudder, depending upon its position left or right, causes the stern to pivot around a point approximately a third of the distance from the bow when going ahead. When going astern, the stern will usually move in the

direction to which the rudder is put.

As only the stern of a single-screw vessel is maneuverable, these vessels are cumbersome unless maneuverability is enhanced in some manner. Tugs are highly effective for this purpose because they may have very high horsepower and they may be placed at a wide range of positions alongside to achieve greatest effect. Maneuverability may also be enhanced by installation of a bow thruster which provides athwartship propulsion at the bow. Bow thrusters are less effective than tugs however as they have limited horsepower (1800 HP is a large thruster) and they lose effectiveness at speeds above 4 knots.

In small vessels the presence of twin screws significantly increases maneuverability. As an example one screw can be operated ahead and the other astern to twist the vessel about often in its own length. However, in large vessels twin screw propulsion would not likely significantly increase maneuverability due to the ship's length and draft in relation to the distance between its propeller shafts.

Differences in maneuvering characteristics may exist between vessels which are steam and vessels which are diesel powered. Modern large diesels may take as long as 40 minutes to reduce from sea to maneuvering speed in order to avoid engine damage. Faster speed reduction is possible in emergencies. Steam plants can be reduced from sea to maneuvering speed generally in a few minutes. Diesel engines have an advantage over steam plants when maneuvering because a diesel plant can apply full power astern while steam plants can normally provide only 40% to 60% power astern.

2. Mooring to Piers and Wharfs

Large ships are secured to piers or wharfs by means of lines which are lead out to prevent fore and aft and athwartship movement of the ship. These lines may be of nylon, polypropelene or wire. Eyes at the terminations of these lines are placed over bollards on the pier. The shipboard end of the lines are secured to bitts aboard the vessel. In some cases wire or synthetic lines may be lead to constant tension winches which automatically adjust the strain on the lines.

The anchor may be used when mooring to a pier or wharf. This is not used to secure the vessel but to stabilize the bow as a pivot point so the stern can be worked alongside.

Tugs are of invaluable assistance in aiding a ship to be berthed or to assist in getting away from a pier. If one tug is used it is normally placed at the bow on the side away from the pier. The bow is then pushed towards the pier by the tug when docking while the stern is brought alongside using the propeller and rudder. If two tugs are used a tug will be placed at the bow and stern to breast the ship bodily to her berth. The single most important tug characteristic for ship assist work is horsepower. The second most important is likely maneuverability. For assisting large tankers tugs should have a minimum

of 1800 to 2000 horsepower.

3. Anchoring

Vessels may be anchored for loading or discharge rather than moored to a wharf or pier. In San Francisco Bay large tankers are anchored in anchorage #9 in the South Bay to facilitate lightering. A modern ship's anchor will weigh approximately 20,000 lbs. This anchor will be attached to 10 to 12 "shots" (90 ft. lengths) of anchor chain. When anchoring the ship will let go an amount of chain which is five to seven times the depth of the water. A combination of the "dig" of the anchor and the weight and friction of the chain holds the ship in place. Ships are equipped with two anchors at the bow.

V. CARGO OPERATIONS

A. LIGHTERING OPERATIONS

"Lightering" is that process whereby cargo is transferred from a larger tanker to a smaller tanker. In this way, the large vessels may reduce their draft enough for them to transit the shallower channels of the North Bay. Lightering in San Francisco Bay is normally accomplished in Anchorage #9. Anchorage #9 is that area that lies to the west of the Alameda Air Station and to the south of the Bay Bridge in the middle of the bay. Large tankers anchor within the confines of Anchorage #9 and then a smaller tanker will maneuver alongside and the two vessels will be secured together, riding on a single anchor. Fenders are normally placed between the vessels to prevent damage from motion. Wires are used to secure the vessels together during the lightering operation. Cargo hoses lifted between the vessels allow for the actual transfer of cargo. Clean Bay Co-operative supplies a skimmer vessel that trails astern of the two tankers during the lightering operation. In this way, if there is a spill, the skimmer vessel is already on scene.

B. BUNKERING

Vessels calling in San Francisco Bay often take fuel during their port stay. Fuel is loaded aboard these vessels from barges. The barge will come alongside and secure to the vessel. A cargo transfer hose is then connected and the pumping of fuel begins. The monitoring of fuel levels on the barge is completed by the tankerman. The monitoring aboard the vessel is done by the Engineering Officers.

C. CARGO TRANSFER EQUIPMENT

Following the safe arrival of a tank vessel to a marine facility much remains to be accomplished prior to the beginning of the loading or discharging operations. The dialogue which occurs is normally between the vessel's Chief Mate, or barge tankerman, and the terminal's wharf manager or supervisor. These individuals must agree on a series of ground rules and safety measures prior to the beginning of the transfer operation.

The paperwork involved in the cargo transfer is completed prior to the transfer. The Pretransfer Conference sets the ground rules for operations at a particular terminal. Items such as cargo volume, number of hoses, emergency systems, communications systems, shutdown procedure and language spoken are discussed. Once agreement is reached concerning the ground rules for transfer the Pretransfer Conference form is signed by both terminal and vessel representatives.

The Declaration of Inspection is another form of significance prior to cargo transfer. The Declaration deals specifically with safety and pollution concerns. It addresses both the specifics of the vessel and the terminal with regard to items such as: cargo hoses, fire extinguishers, pumproom vents, insurances wires and scupper plugs. Once all these items are checked, the form is completed by both terminal and vessel representatives. Other paperwork is also completed at this time but it isn't significant for this discussion.

As the paperwork is being completed, the ship's crew is preparing for the cargo transfer. The ship's crew is "lining up" the ship's piping systems and warming up the pumps. Anti-static cables and cargo hoses are also being connected at this time. The terminal staff is also "lining up" piping systems and warming up pumps in preparation for this cargo transfer.

In all cases, where cargo transfer occurs, there must be a safe flexible connection between parties. Cargo transfer may occur between two vessels or between a vessel and a terminal. The most common type of cargo transfer equipment is the flexible hose. Hoses can be manufactured in a variety of sizes and lengths. Cargo hoses are constructed in layers with an exterior layer composed of rubber. Within this rubber skin, the cargo hose has a mesh steel reinforcing layer and the inner most layer is rubber. Hoses are bolted into position both shoreside and shipboard. Consequently, the steel reinforcing layer is attached to a flange at each end of the hose. These flanges have a number of bolt holes for this purpose.

The American National Standards Institute (ANSI) has established criteria for the number and placement of bolts during hose use. Hoses must be visually inspected by the Person-In-Charge (PIC) of both the delivering and the receiving units prior to cargo or fuel transfer. In addition, hoses must be hydrostatically tested once yearly to a minimum of 100 psi and this fact must be indicated on the hose. In order that a tight leak proof seal be maintained at hose flanges, paper gaskets are used to cushion metal to metal contact. These gaskets should be used once and discarded after use.

Vessels that work with larger volumes of cargo and higher pressures are serviced with loading arms rather than flexible hoses. These arms are sometimes called "chickstands" or "chicksans." The loading arms are constructed in articulated steel sections. In this way, the loading arm may compensate for vessel motions while alongside the berth. Loading arms use similar connections as flexible hoses

although, some terminals have adopted "quick disconnect flanges" on their loading arms. These flanges use hydraulic clamps for connection rather than bolts. Inspection and testing of loading arms must occur yearly according to ANSI standards.

The passage of cargo, fuel or ballast through the ship's piping system can create static electricity. This coupled with the static generated from the vessel's hull moving through the water can create a large difference in potential. When a cargo hose is being connected, this difference in potential can result in a spark. In order to best dissipate this potential energy, upon arrival the vessel is connected to the terminal with a "bonding cable." This cable is the first thing connected and the final thing disconnected during the transfer operation.

The beginning of the cargo transfer operation is the most important part. It is at this point that all the vessel and facility's systems are tested under pressure. Any errors in "lining up" or securing of hoses is quickly found here. Coast Guard regulations require the Person-In-Charge be present on deck or in the control room for both the hose connection process and the start of cargo. Samples of cargo are taken at this time to check cargo quality.

During the long middle part of the cargo transfer, the mates, tankermen and terminal operators continuously monitor the operation. They have each read and signed the paperwork indicating they know what to do in case of an emergency. Rounds are made of the vessel by the mates and unlicensed sailors which include inspections of ship's safety and cargo transfer equipment and spaces. The ship's lines and hose connections are also frequently checked during this period.

At the same time, a series of inspections and rounds are being performed by the terminal personnel. The checks include the water around the vessel, the safety and cargo transfer equipment as well as the hose or loading arm connections. Communications between ship and shore are also frequently tested.

During the final stages of the cargo transfer operation the risk of pollution is greatest. This is especially true when the vessel is loading cargo and her tanks are nearly full. An error in opening or closing valves at this point, could cause oil to spill from the cargo tanks. Even during a discharge operation, ballast being loaded could be release oil into the harbor. The shutdown process requires constant communication between the vessel and the dock.

Following the shutdown of the cargo operation, the hose must be drained and then disconnected. The remaining cargo paperwork is completed and the bonding cable is disconnected. The inert gas system is pumped up to pressurize the tank spaces. This system uses oxygen free gas from the ship's stack to eliminate the possibility of combustion in the tank spaces. The gas is cleaned and cooled and continuously pumped into the cargo spaces during cargo transfer. After securing the cargo, the system is pumped up due to cargo cooling during

the voyage.

IV. NAVIGATION HAZARDS ON THE BAY

The entrance to the navigable channels of the San Francisco Bay are marked by a variety of navigation hazards. Twenty-three miles offshore from the entrance lie the Farallon Islands. This series of three islands, the largest of which is 350 feet high. The two smaller islands lie to the northwest. Vessels transiting into the bay may pass to the north and east of the islands or to the south and west. Once inside the Farallon Islands, deep draft vessels must cross the San Francisco Bar. The Bar is so named due to the silt deposits settling there from the Sacramento and San Joaquin River runoff. The Bar commonly known as Four Fathom Bank extends from northwest to southeast across the Bay entrance. The depth of the water in this region is less than 24 feet. In order for ocean going vessels to safely transit this area the San Francisco Bar Channel has been dredged and maintained at a depth of 55 feet. But even so, on the ebb tide this area can be very hazardous due to steep swells.

Once a vessel has passed over the bar, the next major hazard in transit toward the Bay is the passage under the Golden Gate Bridge. The Golden Gate Bridge, with it's 225 foot clearance, is sufficiently high for even the largest vessels. The 4,000 foot wide channel allows for ample passage. The greatest hazards in the vicinity of the Golden Gate Bridge are the extreme currents.

In the central part of San Francisco Bay, are a number of hazardous rocks and islands within the confines of the shipping channels. In the center of the Bay, is Alcatraz Island with it's large rotating light on top. To the north of Alcatraz Island is Harding Rock, a danger for outbound vessels. Harding rock is marked by a lighted buoy. To the south and east of Alcatraz is Blossom Rock, which is also marked by a lighted buoy.

Vessels turning south along the city front, must select a span for passage under the San Francisco Oakland Bay Bridge. The spans vary in height and in width, with the highest being 240 feet above the water. The bridge spans are lettered beginning on the San Francisco side and the AB span is preferred for southbound traffic while the DE span is preferred for northbound traffic. Vessels passing in the vicinity of the Bay Bridge are restricted in the areas where they may anchor due to the presence of the BART tube passing under the bay. Also the ferry building in San Francisco has a large volume of ferry traffic since the 1989 earthquake that can be a hazard to shipping.

South of the Bay Bridge the channels narrow and shallow considerably. The Oakland Harbor channels have a depth of 35 feet. Traffic passing south to Redwood City must pass under the San Mateo Bridge which has a height of 135 feet and a channel depth of 30 feet. All cables in the Redwood City area have a clearance of at least 155 feet.

Vessels passing Alcatraz and turning to the north must pass Point Blunt on the south end of Angel Island. The channel lies between Angel Island and the Berkeley shallows to the east. Deep draft vessels bound for Richmond or the Chevron Long Wharf will use Southampton Shoal channel. This channel has a depth of 35 feet and is bounded by shoals on both sides. The Port of Richmond has channel depths ranging from 30 to 35 feet. There are no overhead hazards.

The Main Ship Channel passes under the Richmond-San Rafael Bridge just to the west of the 169 foot Red Rock. The bridge has a clearance of 135 feet on the center channel span and 185 feet on the west channel span. Just to the north of the bridge are a series of rock hazards. Invincible Rock and Whiting Rock are both submerged and buoyed for safety. The Brothers are visible as islands and are marked by lights. The Marin Islands lie on the west side of the channel and are not lit.

The Brothers marks the southern entrance to the San Pablo Bay. The Bay is about 10 miles long and is crossed by a narrow, 35 foot, channel toward the northeast. The Pinole shoal channel is reserved for vessels with greater than 20 feet of draft. Much of the remainder of San Pablo Bay, outside the shipping channel is very shallow and sections even show mud on the ebb tide.

At the northern end of San Pablo Bay is the Carquinez Strait. The Strait is about 6 miles long and much of it is less than one-half mile wide. The Strait is entered by passing under the Carquinez Bridge. The Bridge has two spans, 146 feet and 134 feet above the water. The channel at this point is only 998 feet wide. Most of the Strait is relatively deep except for the shoals along the north shore.

As vessels exit the Carquinez Strait, past Point Benicia, they enter the approaches to the Benicia Martinez Bridge Spans. This crossing consists of two bridge spans. The lower of the two spans is the Souther Pacific Railroad Bridge. This bridge has a clearance of 135 feet over the channel in the lift position. The highway bridge is a fixed span and also has a clearance of 135 feet over the channel. The channel through the bridge spans passes very closes to the south shore and the oil terminal facilities at Shell and Amorco. These bridges are affected by the current, especially during the spring and early summer runoff periods.

Just on the upstream side of the Benicia Martinez Bridge, the shipping channel divides. The northern of the two channels continues on toward the Port of Sacramento. The southern channel passes the Tosco Oil Facilities, the Concord Naval Weapons Station, and the facilities in Pittsburgh prior to it's arrival in Stockton.

A. UNITED STATES COAST GUARD VESSEL TRAFFIC SYSTEM

In the wake of the collision and sinking of the fishing vessel "Jack Jr.", the Coast Guard established the Offshore Vessel Reporting

System. This system allows them to track inbound and outbound vessels through radio contact. Vessels check-in to the system at established points. The extent of the system was established drawing a circle with a 29 mile radius from the San Francisco Sea Buoy (LNB). This allows for check-in of vessels coming from all directions.

The vessels check-in by advising Vessel Traffic of their position, speed, course, and ETAs at the check-in points and the "LNB." As the vessel transits the system, there are a number of other reporting points. A tanker downbound from Alaska would check-in 29 miles out, then again at point Reyes, Buoy "N", and check-out at the "LNB."

The information concerning the position and status of those vessels in the Offshore Reporting System is broadcast over a VHF radio frequency on the hour and the half hour, 24 hours per day. This information is collated at the Vessel Traffic Center on Yerba Buena Island in San Francisco. The system is voluntary, although all commercial vessels are encouraged to participate and fishing and pleasure craft are encouraged to monitor the radio frequency.

Radar coverage for the Offshore Vessel Reporting System is limited by the presence of only one radar receiver outside the Golden Gate Bridge, at Pt. Bonita. Radio receivers for this system are located at a variety of locations on the central and northern California coast. One radio antenna is located on a building top in San Francisco, while others are located on mountain tops around the area. These are at Mt. Diablo, Mt. Tamalpais, Mt. Baldy and Mt. Montera.

As vessels check-out of the Offshore Vessel Reporting System, they shift radio frequencies and check in with San Francisco Vessel Traffic System (VTS). This shift from the Offshore to VTS Systems is accomplished within the precautionary area around the "LNB", as the pilot is boarding. In this way, the Coast Guard's radar coverage offshore, which is based at Pt. Bonita, can collate radio information with radar input.

The VTS is operated by the United States Coast Guard and based on Yerba Buena Island in San Francisco Bay. The VTS shares common radio and radar receivers with the Offshore System. In addition, the VTS has radar coverage for the central section of the bay based at Yerba Buena Island. Coverage perimeters extend from the San Mateo Bridge in the south, northward to Pt. San Pablo and westward to the Golden Gate Bridge. The Coast Guard uses civilian government employees to mann radars and monitor radios on a 24 hour basis. Two Coast Guard officers are assigned to the VTS facility for watchstanding. The Officer In Charge is in overall command of the VTS facility and is assisted by an Executive Officer.

Participation in VTS is voluntary, although it is recommended for vessels over 300 tons. This would include all tank vessels servicing San Francisco Bay. Vessels participating in the system are required to check-in with VTS at specified locations and constantly monitor the

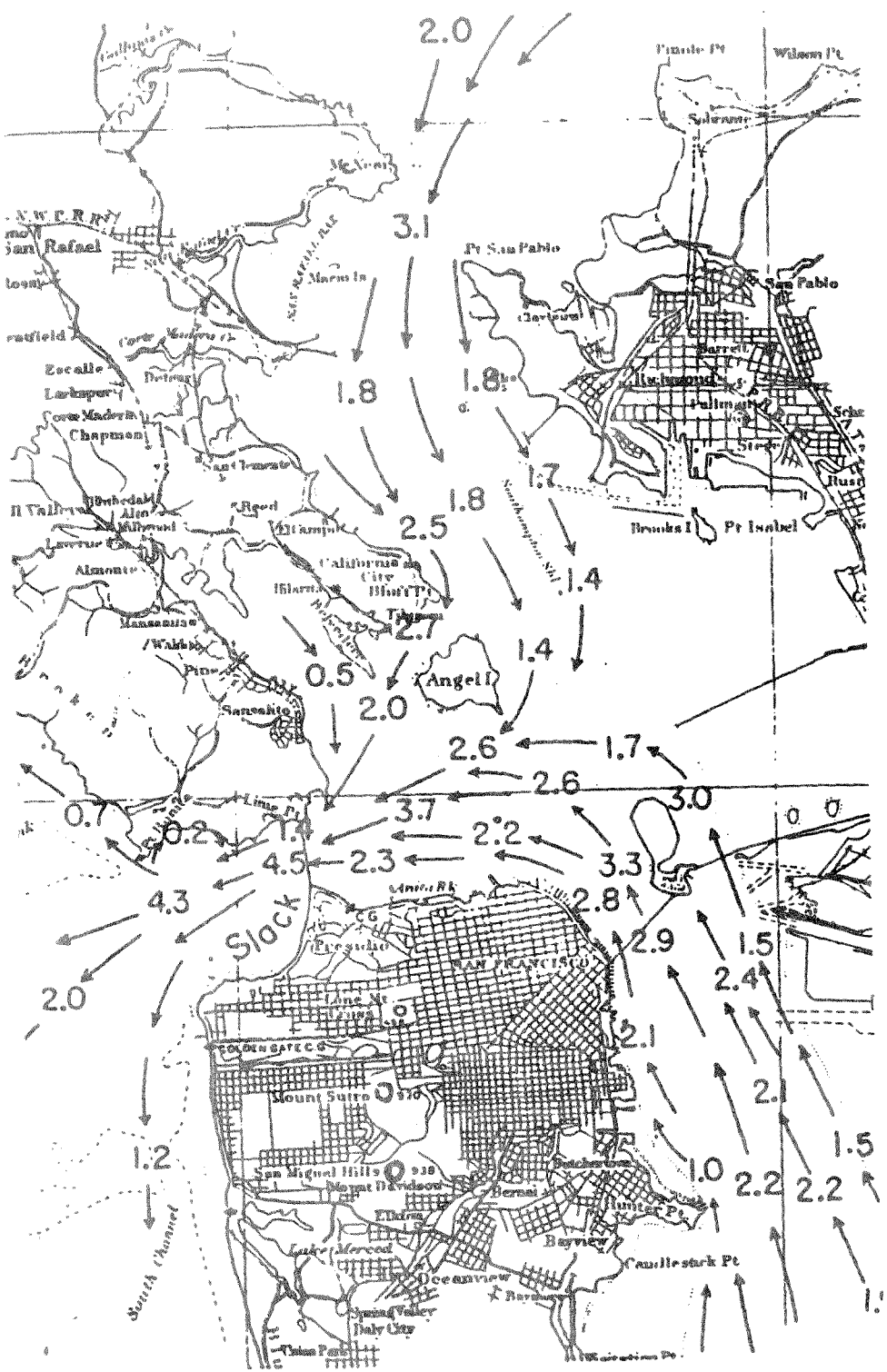
established VTS radio frequency. In this way, VTS may make recommendations concerning hazardous navigation situations. These advisories are transmitted to the vessels involved in an attempt to minimize the chance of collisions in the narrow bay channels.

B. BAY CURRENTS

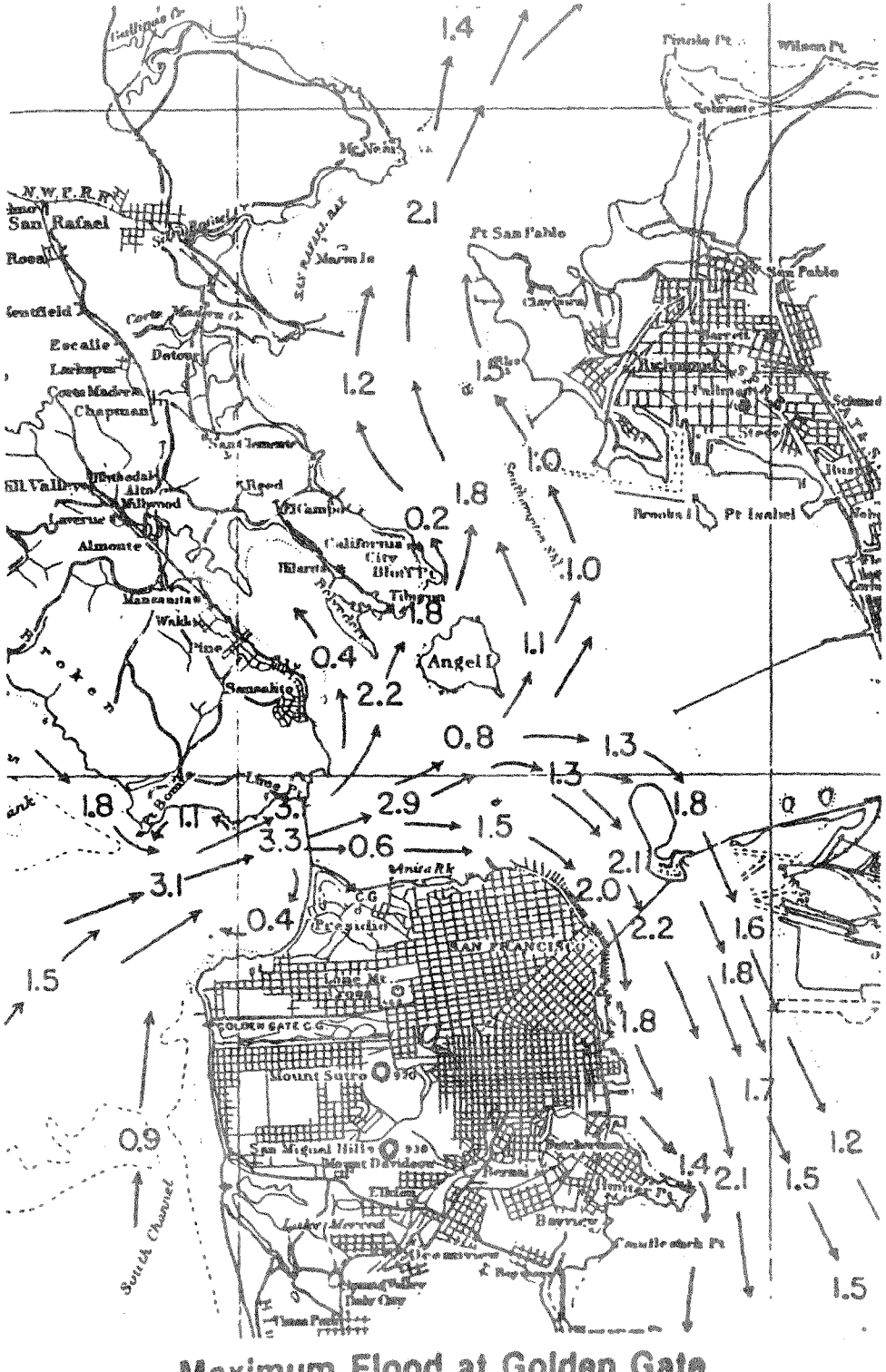
San Francisco Bay is an area widely known for its currents. Due to the interaction of the tidal flow, in the central bay, and the river flow, in the north bay, currents vary widely in strength and direction. during the year the river flow into the bay changes volume and the salt water tidal intrusion extends farther into the north bay regions. This effects the tidal current along the docks and facilities in these regions.

On the ebb, outgoing, tide the current flows down the bay towards the Golden Gate. Because of the narrowing effect through the Golden Gate, the velocity of the current increases dramatically. At times, the current is in excess of four knots. A current of this velocity has a dramatic effect on vessels transiting the bay.

On the flood, incoming, tide the current flows in through the Golden Gate. The effect of the tidal current is reduced in the central and north bay regions by the flow of the river water entering the bay. The funnel effect seen at the Golden Gate occurs on the flood tide also. Another location for this funnel effect is at the Carquinez Bridge.



Maximum Ebb at Golden Gate



Maximum Flood at Golden Gate